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The INDUSTRIAL-ARTS MAGAZINE

APRIL·1918

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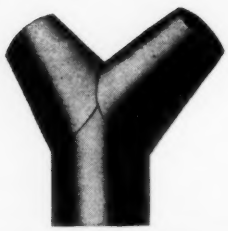

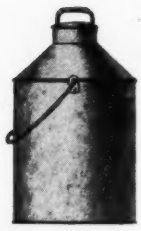

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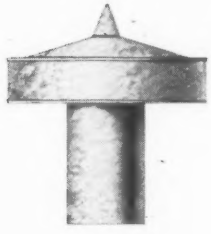

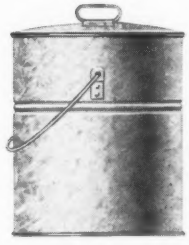

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INDUSTRIAL-ARTS MAGAZINE

Vol. VII APRIL, 1918 No. 4

QUALITATIVE STANDARDS FOR THE MAKING OF CURRICULA IN INDUSTRIAL ARTS FOR THE ELEMENTARY SCHOOL

D. D. Johnson, Assistant Professor of Education, University of Washington.

THE set of standards here presented, with modifications and additions, is the joint contribution of a seminar of twenty graduate students in Industrial Arts Education for the Elementary School at the University of Washington, College of Education. Particular credit is due Mr. Howard R. Goold, Principal of the Irving School; Mr. Winfield J. Stanley, Principal of the Sheridan School; Mr. Hosea A. Whiteneck, Principal of the Logan School; and Miss Lillian M. Gahagan, Principal of the McKinley School, all of Tacoma, and to Mr. Carl Gusler, Superintendent of Schools, Bellevue, Washington, who served as the committee which put the material in final form for presentation to the seminar. Those familiar with the writings of Professors Dewey[1] and Bonser,[2] and Dean Russell[2] of Teachers College, will recognize our indebtedness to these pioneers in this field. Dr. Percival R. Cole's[9] monograph on Industrial Education in the Elementary School and Professor Frank M. McMurry's[3] "Principles Underlying the Making of School Curricula" have been drawn upon heavily and we wish to make grateful acknowledgment. In our use of the term "Elementary School" it is to be understood that reference is made to grades one to six inclusive. By Industrial Arts as a school study is meant, "the distilled experience of man in his resolution of natural materials to his needs for creature comfort to the end that he may more richly live his spiritual life."[2]

In offering these standards we are fully aware of their tentative character and their crudeness of formulation. Hence, we have adopted the viewpoint of Professor E. A. Ross[4] in begging "the discreet critics to lay on right heartily, remembering that in showing the errors they are triumphing *with* the authors and not *over* them."

1. The choice of subject matter and projects in making a curriculum in Industrial Arts for the elementary school should be governed by the following aims:

(a) *To enable the child to live more efficiently his life of choices.*

Every expenditure is preceded by a choice of commodity, whether it be clothing, food, some form of amusement, or any one of many others that might be named. True economy cannot be practiced unless the individual possesses enough intelligence concerning the worth of the commodity to choose the best value. *Industrial intelligence is essential to one who would be thrifty.*

For example, the highest grade of leather is of uniform thickness with no thin spots. Lower grades or spotted leather may appear "just as good" and the consumer who has no knowledge of the different qualities is bound to waste money on cheap values.

(b) *To give him true standards of appreciation.*

Truth in all of its forms is the thing most sought in this life. The individual cannot distinguish between the real article and its imitation unless he knows thru the study of its production what its desirable characteristics should be. Neither can he see the full beauty nor appreciate the true value until he has learned something about the care and skill and sacrifice which have entered into its production. When to these is added the *full realization of the appropriate adaptation of the article to its use,* the thing is likely to possess beauty.

A careful study of the production of any article like fine china, oriental rugs, Bohemian glass, high grade pottery, will reveal the truth of the above statement.

(c) *To assist in the development of right habits of thinking.*

The study of any industry includes the science of that industry. The student thus sees illustrated again and again the fact that certain effects are bound to follow certain causes. He should gain from this the habit of basing his conclusions on known facts, and with that the habit of stating his conclusions tentatively until all the evidence is in.

For example, the maker of clay pots for the glass industry does not guess at his procedure. He knows that unless his clay possesses certain qualities and that unless it is treated in a certain manner, his pots will crack and his labor of months will be lost. Similar experiences may be provided children working in clay, wood, and other material.*

(d) *To give him a sympathetic attitude toward his fellow man as worker.*

The future welfare of the industrial workers will depend upon the attitude of the great multitude of

*In advocating the validity of these aims (a, b, and c) of industrial arts education for elementary school pupils no claim is made for "general discipline." It is believed, however, that the data with which pupils will of necessity work, the situations with which they will be confronted, are duplicated so frequently in real life that considerable "spread" of appreciation and "transfer" of training will result. When this subject is handled by teachers who are thoroly familiar with the conditions under which transfer takes place, it should yield very great *disciplinary values in the best sense of this term.*

consumers toward them. The important part which he plays in supplying creature comforts demands that his welfare become a matter of universal concern. His sacrifices and his needs can never be fully appreciated until a careful and sympathetic study of the worker's environment acquaints the student with them.

In this way the student gains some conception of his future duty toward the worker. He cannot know so well what legislation is necessary for the protection of the worker unless he visits the factory and sees for himself the inconveniences and hazards to which the worker is exposed. For the rest he shall have to depend upon his imagination and his sympathy when perusing material descriptive of conditions surrounding the worker.

(e) *To expose him to vocational intelligence as a means of aiding him in his selection of a life work.*

We do not mean that any attempt to give vocational training will be made in the elementary school. It is our aim merely to give the pupil a background of experience which will help him to think more clearly when he arrives at the point of deciding what his life work shall be.

"Jobs" which bring a small remuneration look very attractive to children and sometimes tempt them to give up an education and thus handicap themselves for life in order to satisfy their present needs. But if these same children are given an opportunity to investigate these "jobs" before choosing one, it will in many cases help them to use better judgment thru foreseeing their possible futures more clearly.

2. Intensive studies of our fundamental industries must precede or accompany any successful attempt to make a curriculum in industrial arts for elementary schools.

(a) An accurate and detailed knowledge of many of our great industries is now available in the reports of industrial surveys and much more needs to be accomplished in this field as a basis for curriculum making in industrial arts.[5]

(b) Information concerning working conditions, seasonal and other fluctuations, present and probable future demands for workmen, opportunities for advancement of the worker in the industry, the intrinsic attractiveness of the work itself (enervating or energizing), economic and social status of the workers, etc., should also be available or in process of being gathered. The reports of social and educational surveys contain much that is of help to the curriculum maker in industrial arts.[6]

(c) Many manufacturers now have printed matter describing their products, the materials entering into the construction of these products, the processes involved in the transformation of these materials, etc., which is of great value for the purpose of curriculum making. The advertising pages of standard magazines and technological journals should be consulted freely when gathering this material.

3. The industries chosen for the curriculum must be typical of a sufficiently large portion of the world's work, in fields vital to the satisfaction of man's needs, to warrant their study by all pupils, irrespective of sex or probable future vocation.

(a) An industry is typical of a group of industries when its processes, materials, and social situations (conditions of employees, etc.) are common to that group.

The manufacture of woolen products is typical of all the textile industries and may serve as the type if in the recurrent presentation of "clothing" the variations which cotton, silk, linen, etc., present are taught.

(b) The typical industry should be the one which satisfies the needs of, or which provides the means of livelihood for, the greatest number of individuals.

Wheat flour manufacture and corn meal production might each typify the milling industry. Wheat flour, however, would be chosen because it satisfies the greater need of society and at the same time affords employment to a larger number of individuals.

(c) Only those industries which produce those commodities generally classed as necessities can be taught because of the limited time available. The essential points of almost all closely related industries can be presented in the consideration of those which are most vital to man.

Pickle making, except in places where it has special local significance, would not be of sufficient importance to include in the curriculum of the elementary school. All of the essential points of the industry could be taught more advantageously in industries concerned with food preservation.

(d) A set of problems and projects accompanied by such data as are necessary for their solution should be furnished for each typical industry included in the curriculum.

"Experience shows that in the world at large knowledge, tastes and skills are most effectually acquired under the stimulus of particular problems or projects, or specific needs of some sort."[3]

"The subdivision of the study into 'topics' is not necessarily eliminated by its organization under problems and needs; for these themselves must often be grouped under heads of some sort showing their scope and general character."[3]

4. From among the industries selected in accordance with the standards set up in 3, those should be chosen for the curriculum *which give greatest promise of correlation with, and therefore vitalizing, other school subjects*: geography, history, elementary science, arithmetic, literature, art, etc.

(a) Any industry chosen in accordance with standards listed under 3, and properly taught, will have the effect of making more vital other school

subjects. This effect, however, ought to be greatest from those industries of greatest social significance. Therefore, it would be expected that the bakers who have 23.5 workers per 10,000 population would furnish a richer field in correlation with geography, history, elementary science, etc., than the butchers who have 4.2 workers per 10,000 population; and that the study of leather, which is worn by all, would be preferred to that of Neolin, which is found upon but a few shoes.

A series of projects in constructing miniature crafts for water transportation (rafts, sailing vessels, steamships, etc.) characteristic of various periods and peoples have been found of great value in vitalizing geography, history, literature, and elementary science. Just now this work is also typical of one of our dominant industries and is of great social significance.

(b) Industrial arts bears the following relation to drawing.

Drawing as a distinct school subject should cease to exist and should find its place largely as an accessory in the study of industry. Picture making and other like phases of drawing belong to specialized professions or vocations open to a very few.

The average child needs to know about the fundamentals of living: how he is fed, housed and clothed; and how to make other choices in problems of existence. Thru these choices a constantly cultivated taste and development of general appreciation of the most suitable, the most useful and therefore the most beautiful will result. There is no reason why this study in appreciation should not include pictures and sculpture—the so-called fine arts.

(c) It follows naturally that what is now taught as manual training, domestic science, and domestic art will be included as phases of the manipulative and constructive aspects of the subject of industrial arts.[2] The social content which gains clarity thru the introduction of these activities will be drawn from the humanities and sciences.

(d) The industries studied should be so correlated that the problems and projects in one will call for facts in another.

"To this end much overlapping of problems and projects is desirable, so that facts may be frequently reviewed from different points of view."[3]

The psychological organization of the industry should be followed rather than its industrial organization, if such a choice must be made. The relative simplicity of problems and projects and their worth to the children in various stages of experience and neuro-muscular development should therefore determine the sequence to be followed in instruction rather than the sequence of industrial processes found in the world of manufacture. An industrial operation coming relatively late in historical sequence in the whole process of manufacture may therefore on account of its simplicity be placed relatively early in the course and taught to young children. The operation of this principle will provide naturally for the overlapping called for in (d).

5. The industries chosen for the curriculum should be those available typical ones (other standards being adequately met) which best lend themselves to *schoolroom application.*

(a) Two or more industries may typify a group equally well, but because of cost or availability of materials, tools, or machines, one may be more readily utilized in the schoolroom than the other and for this reason should be selected.

(b) In applying this standard one should not lose sight of the primary consideration stated under 3, that the basic reason for including any industry must be its vital usefulness and necessity for effective everyday living. There is to be discerned in many schools a tendency to present the showy, the cheap, the merely fashionable projects, or the easy, rather than the important.[8]

6. If industrial arts is to add to the mental and moral strength of the child, if better citizenship is to result, the curriculum maker must *take the child into consideration.* The interests and neuro-muscular development of the child must be studied in making the selection and presentation of the particular industry.

(a) Neuro-muscular skill is of slow growth and excessive or disproportionate demands upon muscular control at an early age are often discouraging to the learner.

(b) Social and economic interests may be developed at an early age if the work is rightly handled. Consideration of the costs involved in production, the elimination of waste, the interdependence of mankind in regard to the satisfaction of creature comforts, and the condition of workers in the industries studied; these and many other interests may be aroused and clarified if proper attention is given to this phase of the work in connection with manual action. It will be observed from a consideration of the aims stated that this furnishes the main endpoint of the course.

(c) *Self activity and social service become integrated in industrial arts rightly taught.* A desire to be of service comes naturally to the child and increases as the means of helpfulness are increased. Industrial arts comes close to the interests of childhood and offers innumerable ways by which the child may be of assistance in the home and the outside world.

7. *The classification of the basic elements* (materials, processes, related science, technology, etc.) involved in the industries selected for study in accordance with the foregoing standards *should be that classification which organizes these basic elements under those utilities* (foods, clothing, shelter, records, utensils, tools and machines[7]) *which are most fundamental in the satisfaction of man's great needs.*

The following considerations are offered in support of this principle of organization:

(a) Such an organization suggests an approach from the standpoint of "efficient utilization in the social sense" which is one of the chief endpoints of the course. It should be apparent that an organization based on materials (foodstuffs, textiles, woods, metals, clays and allied earth products, etc.[2]) would suggest an approach from the standpoint of production.

(b) Education for efficient utilization in the social sense is necessary for all pupils irrespective of sex or probable future vocation and is therefore a part of fundamental or general education and belongs to the elementary school. Education for efficient productive service involves the problem of vocational education and belongs to the secondary school.

(c) In emphasizing consumption, the choosing of utilities rather than their production, attention is more especially directed to the comparison of values, selective judgment, standards of appreciation, etc., than to the mere production of the article. An organization based on materials employed is likely to shift this emphasis to the development of skill and technique in manipulation and thus defeat the main purpose of the course.

For example, it is more important for the ordinary individual to be able to distinguish pure silk from the loaded article than to know the processes involved in producing the particular pattern, or to possess skill in weaving.

8. The curriculum should be so arranged that there will be a recurrence of the typical industries in the successive grades. This means a *spiral curriculum*.

(a) Basic industries such as food, production, textile manufacture, etc., should be studied in the lower grades but they ought also to be met again for a more intensive study in the upper grades. The social conditions of the workers should be especially emphasized in the fifth and sixth grades.

(b) Problems and projects in food, clothing, shelter, etc., should be introduced in each of the six grades with different materials and processes employed in the project in construction or manipulation, and new social content introduced in each case. Thus new projects are used to clarify new subject matter at each succeeding recurrence of work in a given topic, e. g., food, clothing, shelter, etc.

9. In the field of the teaching of industry in the elementary schools, three aspects should receive constant attention: (a) instruction, (b) observation, and (c) manual action.[9]

(a) Instruction will begin with the history and description of the industry conducted near the school, and will extend to all the great world industries.

(b) Observation will involve excursions to farms, factories, or government works in the neighborhood.

(c) Manual work will be necessary in order to prepare for instruction and to fix its results, and will also serve to illustrate objects and implements that have been observed.

The following topics are proposed as a minimum list for industrial arts education in the elementary schools of Western Washington. A partial attempt only has been made to distribute the material thruout the grades.

Foods—

Methods of preservation: Drying, canning, preserving, etc. Preservation of eggs with waterglass.

Typical methods of cooking: Roasting, boiling, baking, etc.

Wheat milling and flour making.

Meat packing industry.

Butter and cheese making.

Clothing and Textiles—

Cotton manufacture.

Woolen manufacture.

Silk industry.

Shoe manufacture.

(Postpone garment manufacturing from vocational point of view until seventh grade.)

(Probably no time for study of the fur industry in any detail.)

Shelter—

Lumber industry.

Brickmaking industry.

Cement industry.

(Casual examination of industries involving paints and plaster, plumbing, wiring, etc.)

Glass manufacture.

Furniture making.

Stoves and other heating apparatus.

Tools and Machines—

Tools employed in food production and manufacture. (Choose to illustrate broad lines of industrial progress in this field: Sickle, cradle, modern binder and reaper, combination reaper, and threshing machine, etc.)

Apply same idea to tools and machines used in making of textiles and clothing. Early spinning wheels and looms, to be compared with automatic and power driven machines of today.

Continue application of this principle of illustrating social progress by study of sledge, wheel, etc., on thru modern railway engine and automobile.

Utensils—

Pottery.

Baskets.

Dishes and chinaware.

Granite ware.

Tinware and cans for food preservation.

Paper boxes.

Records—

Papermaking.

Bookmaking.

Printing.
Pictures (printing and painting).
Maps.
Monuments.
Sculpture, statuary.
Phonograph records.
Card catalogs and loose leaf devices.

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3. McMurry, F. M., "Principles Underlying the Making of School Curricula", Teachers College Record, Sept. 1915.
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8. Park, J. C. and Harlan, C. L., Some facts concerning manual arts and homemaking subjects in one hundred fifty-six cities. 1916. (U. S. Bureau of Education. Bulletin, 1916, No. 32.)
9. Cole, P. R., Industrial Education in the Elementary School.

MODERN SIGN PAINTING AND THE RUDIMENTS OF FREE HAND LETTERING

(Third Article)

W. A. Heberling, Mooseheart Vocational Institute

A SIGN BOARD is prepared for lettering by giving it three coats of white lead paint. After the board has been planed, and sandpapered to a smooth surface, using No. 2 sandpaper, and the knots have had shellac applied to them, the board is ready to receive the first coat. The shellac should be thinned with alcohol to about the consistency of water, as, if this is applied too thick, it would invite the possible peeling of the paint where the shellac had been applied. The first coat of paint should be mixed in the following proportions:

2 lbs. white lead, ground in oil.
1 pint of raw linseed oil.
2 tablespoonfuls of Japan gold size.
¼ pint spirits of turpentine.

The proper method of stirring the lead and other ingredients together (this is called "breaking up" the lead) is to add the oil to the lead about a tablespoonful at a time, stirring it until the mass is reduced to an emulsion about the thickness of thick cream, then add the remaining oil. If this mixture is left standing over night it will allow the oil and lead to amalgamate more thoroly and the drier (Japan) and turpentine should be added just before the application of the paint. The reasons for not adding the Japan and turpentine when mixing the paint are, first, that the drier would commence performing its function of drying, and, in this way, would form a skin over the paint, and cause it to become "fatty," and second, if the turpentine were added to the mixture, it would have evaporated by the time the paint was wanted for use. It is well to strain the paint thru cheese cloth, or fly wire, if the cheese cloth is not at hand, to remove lumps.

Clean vessels, only, should be used in mixing all paints. The priming coat should be applied thin enough to insure penetration, the proper consistency to be about that of skimmed milk, and this is applied with a 2½ inch coating brush. In applying the paint, brush it across the grain, and in all directions, and when about three or four feet have been covered, the brush should be wiped over the inside edge of the pot to remove surplus paint. Now, with just the tip of the brush, smooth the paint out by brushing in the direction of the grain of the wood, being sure to lift any surplus paint over the knots, as the shellac will have closed the pores of the wood, thereby stopping the suction, and if surplus paint remains on the knots, it will simply "skin over" and peel off when the second coat is applied. This operation of smoothing out the paint is called "feather stroking." Another stretch of the board should be painted and the process repeated until the entire surface of the board has been covered, both the face, side, and back. Allow the board to dry for two days, after which the face of the board should be sandpapered until smooth with No. 2 sandpaper, as the priming coat raises the grain of the wood. It will not be necessary to sandpaper the back of the board. The board is now ready to receive the second coat, which is mixed in the following proportions:

2 lb. white lead ground in oil.
4 tablespoonfuls of raw linseed oil.
2 tablespoonfuls of Japan gold size.

The mixture should be thinned with turpentine to a consistency of thick cream. It is advisable to try this mixture on a piece of board that has previously been painted with the priming coat so that it can be ascertained as to whether the paint is too thick or too thin. It should brush out smoothly without the painter feeling any pull on the brush, and yet not be too thin to cover. Apply in the same manner as the first coat. Allow the board to dry for two days and then go over it lightly with No. 1 sandpaper to remove any little "nibs," as they are called. Do not sand it too hard, as you would cut thru and remove too much of the coating.

The layout comes next. We will assume that the board is twelve feet long and two and one-half feet wide, and the inscription that it is to carry is, "BRUCE PUBLISHING COMPANY." The first

Fig. 1.

procedure will be to set aside the border, which in this case, we will say, is five inches from the outside edge. Inside these lines the field, or space, lies on which we will paint the inscription. Measure inside the border line, six inches from each end, not actual measurements, but with the eye and the layout string (the use of which was explained in the preceding article on Modern Sign Painting and the Rudiments of Free Hand Lettering). These marks designate the starting and stopping points and these marks *must be respected*, as an unbalanced sign, no matter how well it is lettered, is an eyesore. The next step is to place the marks for the height of the letters; call this about five inches inside the top and bottom border lines. Take the layout string in the hand, paying out enough string to bring the pencil point to where the eye says to place the mark. Do so, holding the same measurements on the string as the mark is distant from the edge of the sign board; walk to the other end of the board and repeat the mark; still holding the string at the same measurements, now make marks from the top edge of the board to designate the top line. This operation is simply a repetition of the operation used in marking the bottom marks, only that it is inverted. We have two choices of making the lines between the two points at the top and bottom; one is, as shown by the string in the preceding article on Modern Sign Painting and the Rudiments of Free Hand Lettering, and the other is via the chalk line. A fine, cotton, twisted fish line (smooth silk or linen will not do) makes a good chalk line, and by rubbing either chalk or charcoal the length of the line to be used, and placing it on the marks at the opposite end of the board, it is then stretched taut and held securely to the board at the points and then lifted up between the points two or three inches from the board, and allowed to snap against the board, making a distinct line. In the absence of an assistant, a Moore's push pin can be used to hold one end of the chalk line. These operations completed, the lines are ready to receive the layout of the inscription. With chalk, mark just a rough single line of each letter; this, not for letter formation, but just for spacing. If it is found when the stop mark is reached that there are still a few letters left, return to the starting point and space it over again. Repeat this until a nice line of layout, without any signs of squeezing at any point, has been attained, remembering that a good painting cannot be rendered unless the drawing has been faithfully worked out. Better spend two days on a layout and then paint it in one hour, than to do the reverse. When a suitable rough line layout has been made, proceed to double-line it as shown in Fig. 1 (left hand end). This double-line layout is simply the lines showing the outside and inside edges of the letter strokes. The style of letter used here is the same as was shown in Fig. 1, page 349, of the October issue of this magazine. However, it has been condensed, and it may not be out of place to say, right here, that this alphabet is one of the most adaptable we have to elongation or condensing. When a good line layout has been produced, retrace with a charcoal stick and make any desirable corrections. This finished, retrace the letters and border lines with an indelible pencil, after which, give the board the third coat of paint, mixed in the proportions given below:

2 lbs. of white lead ground in oil.
3 tablespoonfuls of raw linseed oil.
1 teaspoonful of Japan gold size.

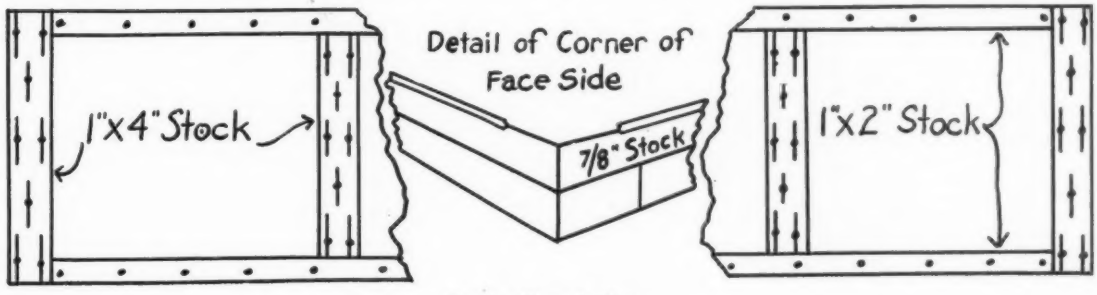
Add sufficient turpentine to thin to the consistency of the second coat, and apply in the same way. No, your layout has not been obliterated; the pencil, being an indelible one, contains aniline color, which will "burn" thru this last coating, showing

Fig. 2.

clearly, and giving a nice, clean surface to letter on, all marking having been done on the previous coat, leaving this coat free from scratches or finger marks. Allow this coat to dry over night, when it will be ready to letter. If a dark background is wanted, all the painting is done *outside* the letter outline, as shown in Fig. 2, page 395 of the October issue of this magazine, and is termed a "cut in" sign. If a letter as shown in Fig. 4 on the same page is desired, it is made by painting *inside* the letter outlines, and this is called "surfacing on." In "cutting in" care must be taken to avoid cutting away any of the letters and reducing their width. (This is one of the bugbears of the beginners, because it throws the entire line out of balance.) Here is a "tip" that will help the student to avoid this: Keep away from the outline about one-sixteenth of an inch all the way around the letter; also be careful not to let your brush "chop" over onto the next space, as it will soil the space which a letter is to occupy. If, by accident, this is done, wipe the soiled spot with a cloth, dipped in gasoline, benzine, or turpentine, and wrapped around the end of the finger. After a little practice, it will be found that the student can cut up close to the layout lines, and, in fact, have the brush do as he wishes it to do. It is advisable to start a sign at the upper left hand corner, doing a stretch of the top border, then the left side, then the bottom, over as far as the top has been done. If any lettering comes within this area, "cut them in" and with the larger brush proceed to "fill in" the background (see Fig. 2) up to where you have "cut in" your borders and letters. Now, cut in another stretch and "fill it in" as before. Do not make the mistake of "cutting in" the entire sign and then go back to fill it in all at once, because this will make a ridge around each letter, which is caused by the paint being double thick at the outlines. The color for this "cutting in" is lamp black, ground in oil, mixed to a paste in boiled linseed oil. If it is desired to make a background of black smalt (a black sand for sign background) the color is given more body by the addition of white lead and thinned with an additional quantity of boiled oil, and should be worked a trifle stiff under the brush. This is done so that the smalt, when sifted on, will adhere properly. (If the background is to be just plain paint background, do not add any white lead to the black; simply thin it a little with boiled linseed oil

Fig. 3.

to working consistency, not thin.) After all "cutting in and filling" has been completed, and while the paint is *still wet*, sift the smalt on with a can which has been punctured on the bottom with a nail, same as the top of a salt shaker. The smalt should be sifted on to the depth of one-quarter of an inch, over the entire background. Allow to lie for an hour, and then dump the smalt off quickly onto a paper, or cloth, which should be a little longer than the board, to catch the surplus. Do not allow the smalt to slide off, but dump it off quickly. If allowed to slide off, the smalt, in sliding over the balance of the sign, will cut loose the smalt over which it slides. Do not bump the board on the floor to knock off any surplus smalt, as this jars loose the smalt which is adhering to the paint. Let this stand for a day, after which, go over the entire surface with a feather duster, which



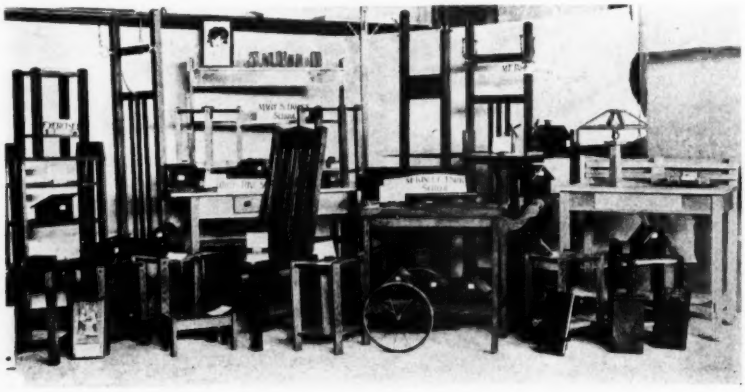
Details of Frame for Signs.

Fig. 4.

removes any loose particles of smalt. (Smalt may be had in various colors, and the paint used for "cutting in" should approach the color of the smalt used.) The border may now be painted, and is left plain, without any smalt. The color for this may be mixed by taking a little of the white left from the last coat, and adding sufficient chrome yellow, ground in oil, to make a rich lemon yellow. Also, add a little linseed oil to the mixture. Leave about a one-half inch white line between the edge of the black smalt and the edge of the border, i. e., there will be a half-inch of white space left unpainted with the yellow, all around the entire black background. (See Fig. 1.) The sign is now ready for the finishing touches, which is "blacking off" the edges, and painting the back. The mixture for this may be made by adding some black to "cutting in" color, if any has been left, and also, three tablespoonfuls of Japan gold size. A good brush for "cutting in" on this particular kind of work would be a No. 8 French camel's hair lettering brush, and a one-inch "one stroke" camel's hair lettering brush, for filling in the space between and around the letters. A mahl stick is very useful to the sign painter for a guide for long, straight lines, and is an aid in making curves, as it allows a larger range for the hand, and it also keeps the hand away from the surface being lettered, keeping the work from being soiled. Figs. 3 and 4 show the mahl stick in use, both for curves and straight lines. In making short lines, it need not be used as a straight edge, but the hand simply rests upon it.

The Sign Board.

White pine is the best material for the construction of the sign board, and if properly protected with paint, will last indefinitely. The drawings show the proper construction as used by representative sign board manufacturers. Galvanized iron is also used, mounted on frames of wood, or angle iron. When galvanized iron is used, it should be treated with a solution of vinegar in which has been placed a few pieces of iron or old nails and allowed to stand for several days. This is called iron acetate, and this is applied with a brush or cloth. When dry, the surface should be washed with gasoline, after which it is ready for a priming coat of paint. Red lead, burnt sienna, Venetian red, or burnt umber should be used for this coat, white lead being antagonistic to metal surfaces. Mix the priming coat for metal as you would the second coat for wood, as the iron, being less absorbent than wood, naturally requires less oil. When this coat has dried any kind of paint may be applied, as the priming coat forms a film between the metal and subsequent coatings.



Articles made in the Grade Shops, Reno, Nev.
Mr. B. M. Hansen, Instructor.

Pennsylvania's First Trade School for Girls

Cleo Murtland

THE Philadelphia Trade School for Girls, established in January, 1916, by the Emergency Aid Committee of Pennsylvania, became a part of the public school system of Philadelphia, January 2, 1918. A resolution recommending that the trade school be made a part of the city school system and that the sum of $13,000 be appropriated from city school funds for the maintenance of the school was presented to the Board of Public Education by the Committee on Elementary Schools and adopted December 12, 1917.

The equipment in use by the school and the rental of the rooms now occupied by the school were donated to the public schools. The staff of teachers employed under the former management and the organization of the work of the school continue under the new regime. At the January meeting of the Board of Public Education it was voted to move the school into a three-story school building located at Pine and Quince Streets as soon as repairs and alterations have made the workrooms, classrooms, offices, assembly room, and lunchroom suitable for carrying on the work of the trade school.

This trade school was the outgrowth of work among unemployed women during the winter of 1915-1916. The women in charge of garment-making workrooms organized during that year to give tide-over employment to girls and women temporarily out of work, discovered that the majority of these women were not fitted for any type of work and that education was seriously lacking. Temporary employment with some instruction was found to be merely palliative, not a means for solving the problem of unemployment, tho for a time the idea that instruction in these workrooms for a short period of time would put these women in the way of finding permanent employment was entertained by those in charge.

This experience directed the attention of the group of women responsible for the establishment of the workrooms to consider more constructive means of dealing with women workers. The trade school was opened in a modest way in a private house on Ninth Street and courses were planned primarily for girls under 16 years of age who are about to become wage earners, for the purpose of making preparation for an occupation, a means of preventing unemployment for the group of girls it would draw into the school. During the first year of the school's existence educators, employers, workers, public-spirited citizens, educational, civic and philanthropic organizations became interested in the development of the school and urged the public school authorities to recognize its place in the public school system of the city. During this period of experimentation and propaganda the Emergency Aid Committee, thru its Division of Home Relief, expended $8,285 for the maintenance of classes in dressmaking, millinery and lampshade making and novelty work. The committee in charge of the trade school realized that the work must attain greater proportions than were possible in a small private house if the school was to realize its fullest possibilities. With the development of the work in view the Emergency Aid Committee turned the school, with funds for maintaining the work for three months, over to the Philadelphia School Mobilization Committee of the Mayor's Committee of Home Defense early in July, 1917.

This change placed the school in the hands of a public committee, thus bringing it more prominently to the attention of the people of Philadelphia, and made it possible to move the school into larger quarters, thereby giving much-needed space for enlarging the scope of the work and increasing the enrollment of pupils. The business appearance of the large factory-type rooms gives an atmosphere of business which adds to the interest and prestige of the school.

A formal request that the school be taken in to the public school system of the city was presented to the public school authorities in September by the School Mobilization Committee. The request was referred to a special committee for investigation and report. The committee visited the school, investigated the work, and reported to the board of education at the October meeting. This report approved fully the work of the school and recommended that it be taken into the public school system January 1, 1918, if sufficient money for its maintenance could be secured from public school funds. This report was adopted and at this juncture the Seybert Institution, an endowed and influential organization of Philadelphia, appropriated $3,000.00 for the maintenance of the school for the months of October, November and December. This contribution, together with the added force to public opinion which it gave, enabled the school to continue the development of the work on a desirable basis during the months pending the final adoption of the committee's recommendation. This action was taken December 12, 1917, when the Board of Public Education appropriated $13,000 for the school year beginning January 1, 1918, which made the trade school a public school project.

The first stage in the development of trade education for girls in Philadelphia has thus been accomplished. The establishment of the school in the public school system, its consequent claim upon public funds, and recognition among the educational institutions of the city assures the full development of this phase of educational work in the city. Before

LEARNING POWER MACHINE OPERATING AT THE PHILADELPHIA GIRLS' TRADE SCHOOL.

the end of the present school year the school will have a permanent home in which to develop fully the courses already established, and some space in which to develop additional trade courses. The present quarters accommodate one hundred girls; the new quarters will accommodate two hundred girls. Altho a small project for a city the size of Philadelphia, a school of two hundred pupils will give an opportunity to demonstrate what a trade school can do for girls contemplating wage-earning in the trades at 16 years of age. There will also be opportunity in the new quarters to develop much-needed evening trade courses for older women. Trade courses offered thus far are: custom dressmaking, children's custom-made clothing, custom millinery, factory garment making—dresses and waists, muslin underwear, shirts and special machine work such as machine hemstitching, buttonholes, machine embroidery, two-needle stitching, and bonnaz embroidery are included in the power machine department.

Some rather radical departures are being made in the custom course, similar tho they may seem to those offered in other trade schools. The dressmaking department does not include a course in fine hand-made underwear and waists. Such fine hand sewing as is offered is given in connection with the advanced dressmaking. The so-called elementary sewing course usually given in the trade school is also omitted. Work of this character is given in connection with the making of children's clothing. A third departure from the usual practice is the inclusion of power machine sewing in the dressmaking course. This machine work is given for the express purpose of training prospective dressmakers to do the machine sewing which constitutes an increasing amount of custom garment making. The course in factory garment making includes muslin underwear, aprons and house dresses, shirt waists and tub dresses, middy blouses, and, later, men's shirts will be added to this course. These courses include the making of the entire garment and the performance of single operations as team work or as specialized operations. The entire garment is given for the purpose of teaching garment construction, which is an important item in training skilled operators. Few pupils continue longer than half the term of garment making. Those who do continue the garment making do the higher grade work and are the type who may become sample makers. Special machine processes such as button hole making, hemstitching, machine embroidery and bonnaz work are given as supplementary to the regular course.

Specialization for skill in workmanship and rate of speed and for choice of the particular type of work desired is given as entrance into wage earning approaches. Early specialization is limited to those pupils who show little skill in workmanship or understanding of garment construction.

The school week is 32½ hours in length. Sixty per cent of this time is devoted to trade work in the school workrooms and forty per cent to academic instruction and other school activities. The academic subjects include arithmetic, English, spelling, civics, history, textiles, and business practice. The art course includes color and design, as related to the trades taught. Emphasis is placed upon subject matter related to the several trades taught, tho there is no hesitancy about departing from the immediate demands of the trade when essentials have been learned, and interest in other topics is sufficiently real to make such instruction vital to the pupils.

The length of the course is one school year. The course is so planned because this appears to be the length of time the girls taking the trade courses can add to their school careers. Girls who leave the school to go to work before they are 16 years of age must become members of a continuation class according to the state law of Pennsylvania. Trade school graduates will return to the trade school for their continuation work. This arrangement is offering a splendid opportunity to further the trade as well as the general education of these girls. While not in operation now these courses will be organized immediately and much attention will be given to developing the continuation courses for these girls along lines which will make their continuation study

a real factor in their occupational interests and their social and civic outlook as well as their general educational work. The school regards this particular work as a rich opportunity.

Entrance requirements for the day classes are the same as the state requirements for obtaining employment and the employment certificate—14 years of age and completion of the sixth grade. Of the pupils in the school at the present time about forty per cent have completed the eighth grade.

Placement of graduates in suitable positions and follow-up work after graduation is being developed thru co-operation with the Bureau of Compulsory Education and the Committee on Vocational Guidance of Philadelphia. The bureau is a department of the public schools and the Committee on Vocational Guidance is an organization financed by private funds but working in co-operation with the Bureau of Compulsory Education.

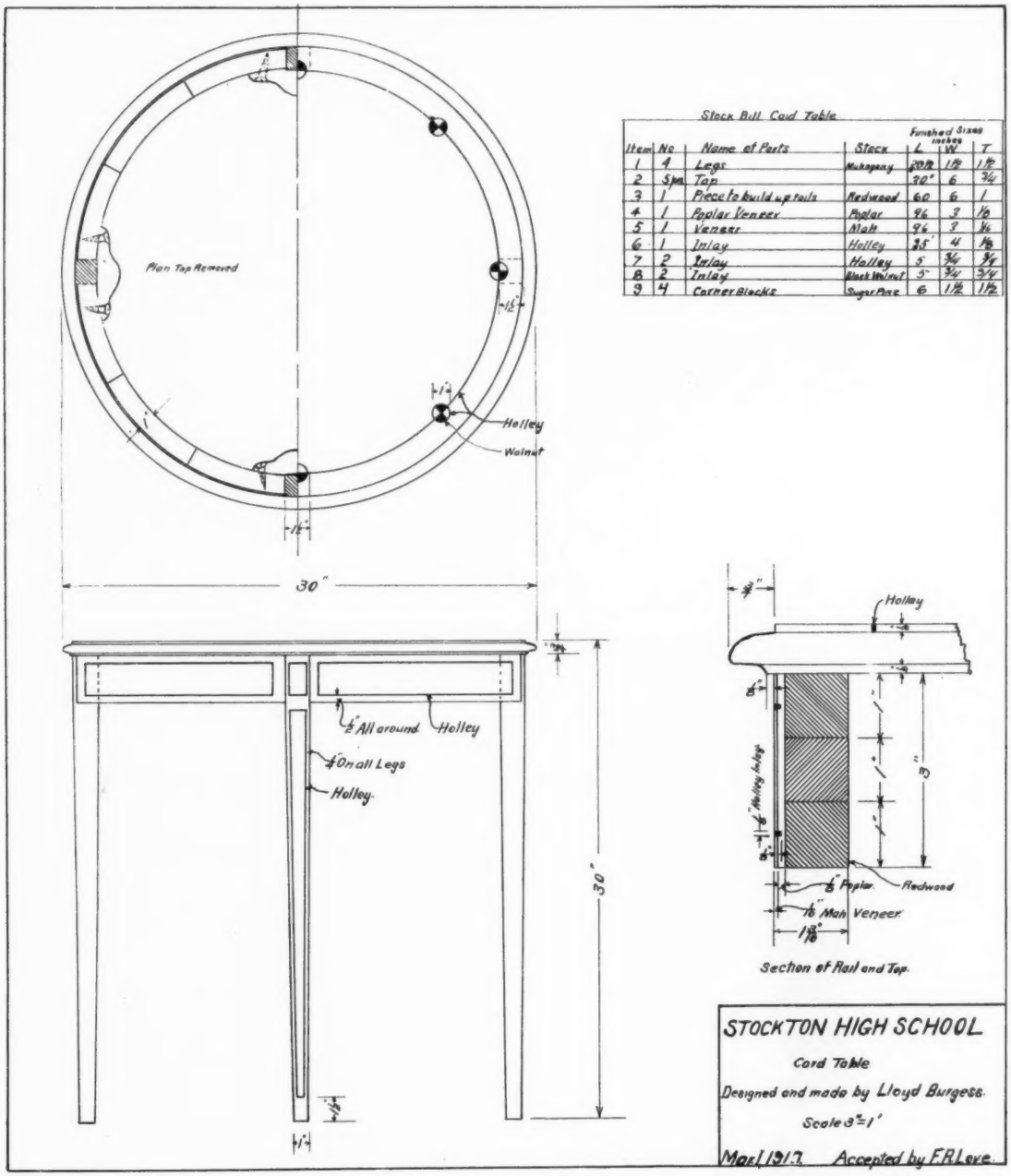
The trade courses are taught by experienced trades women. The art and academic courses are taught by professionally trained women selected for the work because of their interest in the productive work of the trades and the social and economic problems of trade school girls. Much has been made of war work this year. Red Cross garments and mending for the Red Cross shipping rooms has been done periodically with great success. When this type of work is to be done a special "Red Cross Day" is set aside and the girls, in uniform, devote the entire day to this patriotic work. School recreational and social activities have also had their place in the school program. Supervised play during the noon hour and an occasional evening entertainment have had careful attention. Situated near the business section of the city, the trade school will be made a desirable center of recreation for girls attending the school as well as for those who have left the school to become wage earners. In making the trade school a public school the Board of Public Education appointed a visiting committee whose duties are "to visit the school at their convenience, to keep themselves informed of its needs, and to make recommendations they deem necessary for the information of the Committee on Elementary Schools" in whose charge the school is now placed. This committee is made up of representatives of the founders of the school, the Emergency Aid Committee, the manufacturers association, the trade unions, the public schools, social workers, the Seybert Institution, Carson College for Orphan Girls, a committee representing educational and civic interests and trade interests.

It is recognized that the school as at present organized does not cover more than a small number of the lines of industry which employ women workers, nor does it represent all the types of industrial work for which training is needed and may be given. The trades included in the curriculum have been chosen because they hold an important place among the industries of the city and because they have attained a place in educational work which makes it possible to begin courses and so open the way to other types of industrial work which offer desirable employment, an acceptable wage, and a teachable content which will eventually claim a place in education. That this larger development of industrial education must come is recognized by educators as well as by industrial leaders.

Philadelphia is one of the largest industrial cities in the country, a city of varied industrial activities, the center of the knitting industry, a leading city in the manufacture of cotton and woolen woven fabrics, a shoe manufacturing center, a community with large

MILLINERY APPRENTICES AT THE GIRLS' TRADE SCHOOL, PHILADELPHIA.

printing establishments, extensive jewelry factories, and many other industrial interests which employ women workers, and presents an extensive and varied field for the development of vocational education for industrial employments. With federal aid and federal recognition to stimulate wide-spread interest in industrial education as a part of the vocational education program Philadelphia is in a position to develop an industrial education program second to none in the country.


Stock Bill Card Table
Item | No | Name of Parts | Stock | Finished Sizes inches L | W | T
1 | 4 | Legs | Mahogany | 30" | 1½ | 1½
2 | Spl. | Top | | 30" | 6 | ¾
3 | 1 | Piece to build up rails | Redwood | 60 | 6 | 1
4 | 1 | Poplar Veneer | Poplar | 96 | 3 | 1/10
5 | 1 | Veneer | Mah. | 96 | 3 | 1/16
6 | 1 | Inlay | Holley | 35' | 4 | 1/8
7 | 2 | Inlay | Holley | 5' | ¾ | ¾
8 | 2 | Inlay | Black Walnut | 5' | ¾ | ¾
9 | 4 | Corner Blocks | Sugar Pine | 6 | 1½ | 1½
Plan Top Removed
Holley
Walnut
30"
All around
Holley
On all Legs
Holley
30"
Holley
Holley Inlay
Poplar
Redwood
Mah. Veneer
Section of Rail and Top.
STOCKTON HIGH SCHOOL
Card Table
Designed and made by Lloyd Burgess.
Scale 3"=1'
Mar. 1913 Accepted by F.R. Love.

DETAILS OF CARD TABLE DESIGNED AND MADE BY STUDENTS OF STOCKTON HIGH SCHOOL. (SEE NEXT PAGE.)

Period Style Furniture For High School Work

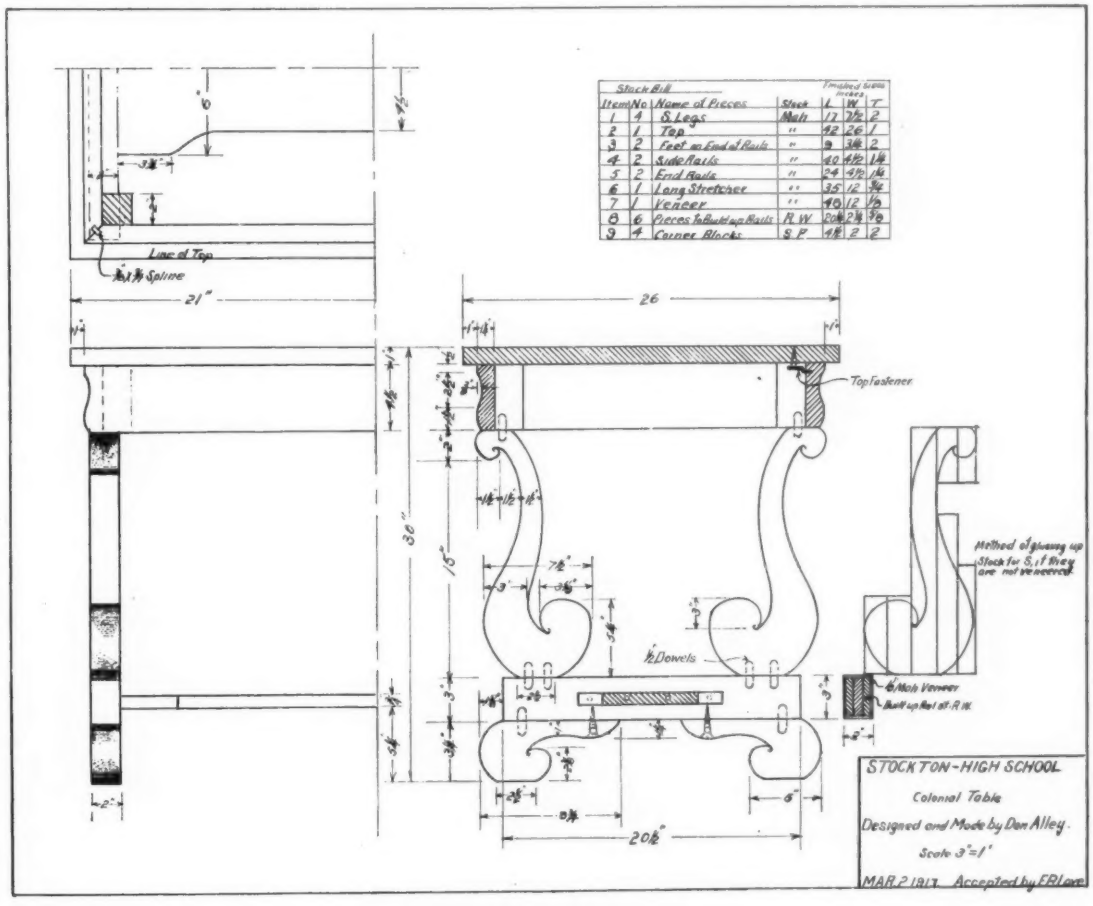
F. R. Love, Head of Manual Arts Department, Stockton High School, Stockton, Cal.

A FEW years ago shop projects were very easily chosen, as the predominant style was mission with designs very simple and easy to reproduce. However, times, customs and demands have changed and if we wish to keep pace with the latest and best commercially we will have to look to something besides mission furniture for an inspiration. Most of us continue in the mission work because we were raised on it and believe it to be much easier designed and made. Why pick the easiest for our work? Does mission furniture really have enough variety in design, detail and construction for us to use it and nothing else? To be sure, work in period styles requires a little more study and more close supervision, but it is worth it. You have an endless variety of designs and most any period style can be so modernized that a first-year high school boy can produce it.

There is a wonderful chance here to correlate your bench work and turning. You can see in the photographs that most of the pieces have some turned parts.

Modernized Sheraton Card Table.

We have been doing period work here for four years and each year I see an added interest in it. We average one talk every two weeks on some particular style and the boys make reports on the dif-



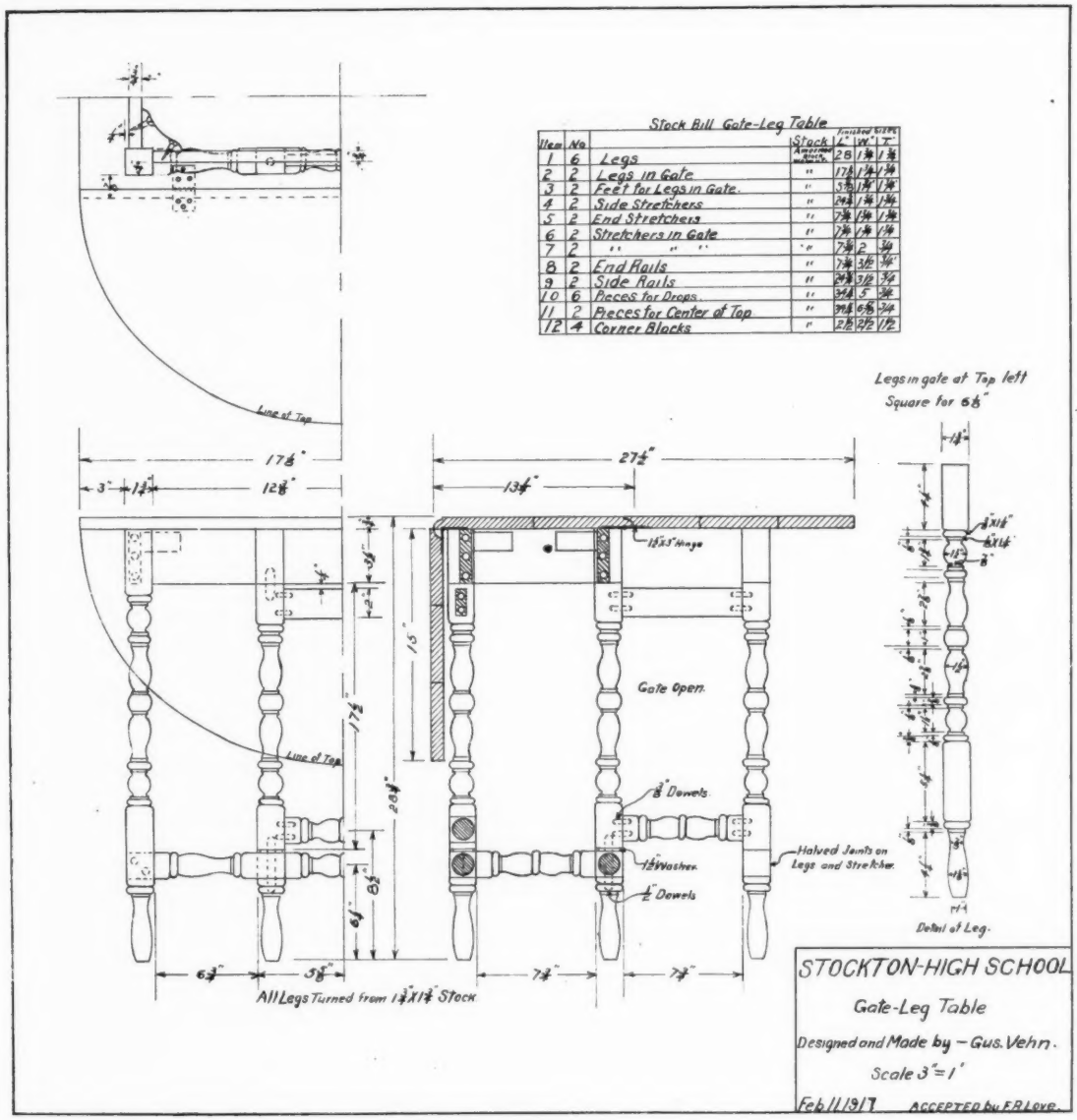
DETAILS OF COLONIAL TABLE.

ferent pieces shown in the display rooms of our furniture stores. The work is outlined to require a minimum amount of reading. Most of it is done from observation and reports made from these.

We try to proceed in the designing and construction of our work the same as they do commercially. The boy chooses the particular style or period that he thinks he wants, then talks it over with the teacher. They decide whether that particular style will fit in and harmonize with the other furnishings in the room in which it is to be placed. Here he is given some idea in regard to the relation between architecture, interior decoration, and furnishing.

After the style is chosen, if possible, a perspective is made. This cannot always be done as the student has not had the proper amount of freehand drawing. From the perspective a clearer idea in regard to the relation of dimensions is obtained and it helps greatly in the detailing. The next step is to decide whether a full-size detail rod or quarter-size drawing is re-

Colonial Table.


Stock Bill Gate-Leg Table
Item | No | Stock | Finished Sizes L" W" T"
1 | 6 | Legs | Amount wanted | 28 | 1¾ | 1¾
2 | 2 | Legs in Gate | " | 17⅛ | 1¾ | 1¾
3 | 2 | Feet for Legs in Gate | " | 3½ | 1¾ | 1¾
4 | 2 | Side Stretchers | " | 24½ | 1¾ | 1¾
5 | 2 | End Stretchers | " | 7⅞ | 1¾ | 1¾
6 | 2 | Stretchers in Gate | " | 7⅞ | 1¾ | 1¾
7 | 2 | " " " | " | 7⅞ | 2 | ¾
8 | 2 | End Rails | " | 7⅞ | 3½ | ¾
9 | 2 | Side Rails | " | 24½ | 3½ | ¾
10 | 6 | Pieces for Drops | " | 9¼ | 5 | ¾
11 | 2 | Pieces for Center of Top | " | 9⅛ | 6⅝ | ¾
12 | 4 | Corner Blocks | " | 2⅛ | 2½ | 1½
Legs in gate at Top left Square for 6⅝"
Line of Top
17⅝"
3"
1½"
12⅛"
27½"
13¾"
1½x3" Hinge
Gate Open.
Line of Top
8" Dowels
1½" Washer
½" Dowels
Halved Joints on Legs and Stretcher
Detail of Leg.
All Legs Turned from 1¾"X1¾" Stock
STOCKTON-HIGH SCHOOL
Gate-Leg Table
Designed and Made by – Gus. Vehrn.
Scale 3"=1'
Feb 11 1917 ACCEPTED by F.R. Love.

DETAILS OF GATE LEG TABLE

quired to work from. If it is a table, writing desk, book-case or any piece where it is possible, we always use a rod. In chairs or any piece where there is any curved work, we use a full-size detail.

After the rod or full-size detail has been made we next make our templets. These templets are made by placing the curved parts of the drawing that we wish to produce on a $\frac{1}{4}''$ redwood board and then every $\frac{1}{4}''$ on the drawing we pierce it with a very small brad awl. This reproduces the shape of the object on the board so that it can be sawed out on the band saw and shaped with a plane or spoke shave. When all the templets are made the stock is milled out in the rough. Then all the parts are milled to size and shaped and planed up by hand. We then bore out dowel holes and assemble the pieces temporarily,

Modernized Jacobean Card Table.

Modified Hepplewhite Gate Leg Table.

using a dowel a little smaller in diameter than we expect to use when gluing up. If all parts fit, the work is torn down, larger dowels are used and the work glued up.

The colonial table shown is about as easily made as one could wish. The curved work is not difficult and the veneering is very simple.

The round card table is of no particular style but might be called a modernized Sheraton. The rail is built up, veneered and inlaid with holly. The round top, the modeled edge, and the groove to receive the holly were all done on the lathe. Two strips of walnut and two of holly were glued up end grain and turned to 1″ in diameter. Small pieces $\frac{1}{8}''$ thick were sawed from these and glued in the 1″ holes in the top. All the legs were inlaid, the grooves being cut by hand with a good sharp scratch gauge. The most difficult job in the making is gluing it up. A good chain clamp is needed for this.

The table with eight legs is a modernized piece and might be called Hepplewhite. All the legs were routed out to make them appear paneled and the rails curved to form a continuous curve from the legs. All the rails have a paneled effect and the design is very pleasing after it is seen made up.

One of the most interesting tables that can be made is the old gate leg. Here we have a good chance to correlate bench work and turning. This particular style might be called Jacobean.

The hexagonal card table is another example of the correlation of bench work and turning. This is also a modernized piece but the general lines were taken from a photograph of an original Jacobean.

All the photographs and drawings are table examples and many more might be shown that are easy to make. We have just as much variety of work in chairs, dining sets and in nearly all kinds of furniture. If you have not tried working in the period styles, try it and just see what an added interest you will find in the work for both you and the student.

FROM the great universal storehouse every artist after his kind quarries out his material. Years of work and experiment teach him its properties, and give him facility in dealing with it, until he finally forms from it the speech and language which seems to him best fitted to embody and convey to the world what he has in his eye and mind.

Walter Crane

THE PROJECT—SINNING AND SINNED AGAINST

L. L. Jackson, Assistant Superintendent of Schools, Montclair, N. J.

UNLESS Professor Dewey is joking, and he is not particularly a facetious man, there is no thinking without a problem. Thinking begins at the forks in the road where judgment is challenged to face a dilemma. If the habit of right thinking is a desirable training to be derived from the school, the problem or project method is surely in line with correct psychology. It may be, however, that our teachers of practical arts are not fully aware of the possibilities of manual projects to fulfill the object of mental training, and if not, an illustration may be ventured. Suppose we select for our project the much abused taboret. Perhaps no object has been more often assigned in the school shop and no product has yielded more cripples and monstrosities. The bookminded pedagog, and the habit-formation educators alike, have with seeming justice condemned this result. They have sentenced it to solitary confinement on the charge that it was an accomplice in a case of educational murder. But the defense is as simple and classic as the project, namely, the act was unpremeditated. The truth of the critics' position depends wholly on the purpose in the mind of the pupil when he undertakes to make a taboret. If he purposes to produce an artistic cabinet-type of furniture and ends with an unsightly botch, then his efforts have availed little educationally. On the other hand, if the pupil desires to present his mother with a piece of his handiwork, and by his honest efforts creates only a travesty on furniture, the educational value of the project is not lost. The first condition of a proper school task, or assignment, is met when the pupil acts under a worthy purpose. This position is not unsupported in our non-school institutions for the courts never convict a defendant of anything worse than negligence unless the *intention* to commit a crime can be proved.

Furthermore, the practical arts project, even our much abused taboret, satisfies more than the first educational criterion. As soon as the pupil is ready to carry out his resolution, he either takes the first piece of wood in the stack, after the manner of taking the next ten words or problems or pages, or he seeks the materials most suited to his project. In the latter case he *passes judgment* on several kinds of wood, different methods of construction, and types of finish. He summons his knowledge of timber qualities and of strength values and makes a selection of stock consistent with known standards of adaptability. Few pupils have sufficient information to make this decision until they have made a study of the problem. Thus, the despised taboret not only fulfills the second standard of good teaching, namely, the exercise of judgment, but it provides a real motive for gaining a fund of useful information. Then, too, in the matter of motivation, one should not forget its companion, participation, for however compelling may be the incentive to action in a given project, the educational effect is multiplied by individual participation in the activity; and the practical arts project, if properly handled, enlists the service and co-operation of the pupil's power both physical and mental.

In passing to the third educational test, our project is not deficient, for no pupil can intelligently execute a chosen design for a taboret without exercising his capacity for organization. The mere assembling of the parts already worked out, according to the specifications governing the design, is an organizing process. The considerations that led to the sizes of legs and braces and the styles of joints consistent with a given design were all steps in organization. Even in the selection of pieces for individual purposes, it is necessary to consider the fitness of the several parts for combination into the whole taboret.

If the pupil's task were the learning of a business rule, or the mastery of an arithmetical law, the work would not be regarded as educationally complete until an *application* of the rule or law had been made. This educational standard is likewise applicable to our manual training project, for the test of usage is unavoidable. Even if our taboret proves too weak for service and is relegated to the display shelf, it has none the less fulfilled its educative mission by revealing under *test* the opportunities for further improvement in design and execution.

It is scarcely necessary to say that initiative and independence are desirable results of school work and attainments that must accompany successful teaching. These standards, too, are not hard to satisfy in conducting practical arts projects. It must not be supposed, however, that any of the products of good education follow necessarily from a course in practical arts; useless and harmful training can result in the shop and kitchen as well as in the academic classroom. For example, the factory method might be so used as to stifle initiative and independence. In any case the teacher must by proper methods create the opportunities for the exercise and development of the desirable mental activities.

The educational value of most school topics, problems and projects end with their contribution to the capacities for proposing, judging, organizing, applying, initiating and executing, while others, particularly practical arts projects, like our humble taboret, still have virtues to extract. The creation of an object may be wholly justified when it has been so made as to fully satisfy its purpose and so placed as to do its allotted work; in short, when it becomes the right thing in the right place; but it has the further

important possibility of being made an object of art. If its proportions are balanced and its lines are in harmony, the simplest decoration may convert it into an object of beauty. It is easier for the pupil to create this objective type of beauty than to realize the ideal beauty inherent in some academic projects. For example, it is easier to make a practical taboret and decorate it into a piece of enjoyable art than to establish the purpose of social service to the sick, make the necessary study and organization, and visit the homes of shut-ins. The latter is a higher type of activity, and if undertaken in charity and love, it is an example of the fine art of education; but the opportunities of the school to realize the art element are more numerous and more elementary as they exist in our practical arts courses, and they at least make a stepping stone to the higher appreciation. This element of art multiplies the pleasure-giving capacity of the project, and it enables the pupil to share his satisfaction with others which is too often impossible with school activities.

This conception of project-teaching naturally raises the question of time and quantity. Such a treatment of each unit of work requires more time than the sloyd system or the tinker shop, also a much broader preparation on the teacher's part. The teacher facing our generally crowded courses of study, feels the necessity of hurrying thru subjects and is apt to conclude that project-teaching is inconsistent with the requirements for information-getting. The probable answer to all this is two-fold: First, right habits of thought are more important than most information, and second, most curricula consist of a minority of important information and a majority of secondary information. Furthermore, it is now generally conceded that education is not chiefly concerned with technical knowledge and technical skill except in the strictly vocational field.

The project-method foreshadows the practice of teaching thru types, and after all, is not this plan likely to be the ultimate solution of the quantity question?

For example, the pupil of the future will not get his concept of statesmen from a composite of the biographies of all the statesmen of Europe, Asia, and the Americas, but from a few *typical* statesmen from these countries; and this pupil will not get his idea of hardwood from a formal study of many varieties but from a practical handling of several typical specimens in connection with a few real constructive problems. This method is not highly scientific and is accordingly more adaptable to school work in intermediate grades. But wherever we may draw the line on the quantity of informational matter in our curricula, the project method in practical arts work furnishes the best way of getting in touch with industrial information. It also thru correlation helps greatly to motivate academic information and the three R's.

Thus our humble taboret is a type which needs only the help of the modern teacher's viewpoint to make it educative by way of purposeful, judicious, logical, and independent thinking and to open the further possiblities of participation, co-operation, information-getting, self-satisfaction, and pleasure giving.

LANDSCAPE STUDY

Drawing in the High School—Third Article

Beatrice Cannon, Chicago, Ill.

CONSIDERED from the standpoint of Representation or Pictorial Interests and Design:

Light and shadow.

Line.

Perspective.

Pictorial composition.

Decorative treatment of composition.

Adaptation to surface ornament.

These headings have been taken up in the following order in these pages since in the classwork here described the sequence developed naturally:

(a) Pictorial composition.

(b) Line.

(c) Decorative treatment.

(d) Adaptation to design.

(e) Perspective.

Pictorial composition, belonging so largely to both divisions, seems an excellent place to begin, as, with a little direction the pupil may, in the course of his study, follow these diverging lines of interest and yet appreciate their necessary blending and overlapping.

Pictorial Composition.

This is taken up first with reference to the all pervading principle of spacing, composition or patterning—as we may choose to designate it. The pupils have very probably had experience in this sort of picture making in their work in the grades, and have been accustomed to note various aspects of nature for purposes of illustration, i. e., with a story telling motive. Just as, in the earliest grades, they are keenly interested in making even the crudest representations of each other and of living animals, so a little later they enjoy using inanimate nature as story telling material, and where their English or nature work has had a landscape setting, they have been quick enough to observe and depict similar effects, as the seasons, times of day and kinds of day—gray, sunny, etc., with the variations of pervading color and tone. Therefore, in this introduction to the topic their interest is more easily gained

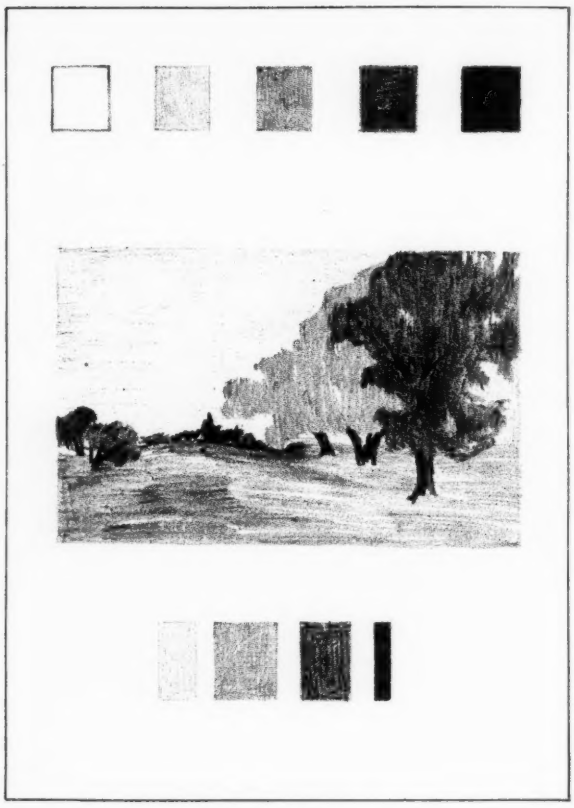


Plate 1.

by a different approach. In the grades, particularly earlier ones, the child's work is spontaneous and unconscious, and his experiences, often, detached and unrelated in his mind. One of the tasks of the high school is to gather up such scattered threads and make them a conscious possession, with the sense power and practical efficiency which comes from such consciousness.

The study of pictures is a good means of approach in the high school; at first those of our own artists and period, with only such reference to older art as seems to come so logically that it makes an interesting addition; having some similarity of composition or connection with the story of the growth of this branch of art. They should become at this point acquainted with the pictures of one or two American landscape painters whose pictures are accessible in local galleries or in reproductions, if only in current magazines, for instance, Inness, Tryon, Dewey, Metcalf, Gardner Symonds and J. Francis Murphy. If it is possible to extend the list for the sake of the historical connection, it might be made to include two or three of the Hudson River school—as Bierstadt, Hart and Cole. If time is limited this connection can be made later.

The material can be vast'y extended in a way which appeals to a special interest of many of them, namely, by use of amateur photographs. Some of the most interesting lessons can be carried out with a collection of photographs (made with the aid of the pupils) of landscapes, good bad and indifferent; the purpose of the discussion being to discover why some are good and to transform the others into good compositions as their drawing exercise.

There is always a very strong interest to the pupil in stories of peoples and their doings and this can be profitably utilized by telling anecdotes concerning the picture or artist under discussion; anything in fact which will serve as an additional magnet to their attention. They are just as susceptible to this story telling appeal as the younger children, and this aids in producing a friendly attitude of mind toward the pictures, something of a feeling that here after all is a problem of human interest, not merely an academic production. In one class after we had passed this point, and a great deal of interest had been aroused in landscape in general, we discussed more in detail some very good photographs and some amateur sketches. The class was asked to note the number of tones in some of the pictures, the light and dark arrangement, number and distribution of the masses, i. e., the spotting referred to in the paper on good arrangement. Of course, the pictures chosen for beginning had been carefully limited to such as were simply constructed and would not produce confusion in a simple analysis. From this we evolved the five-tone value scale as a basis of work. (Plate 1.)

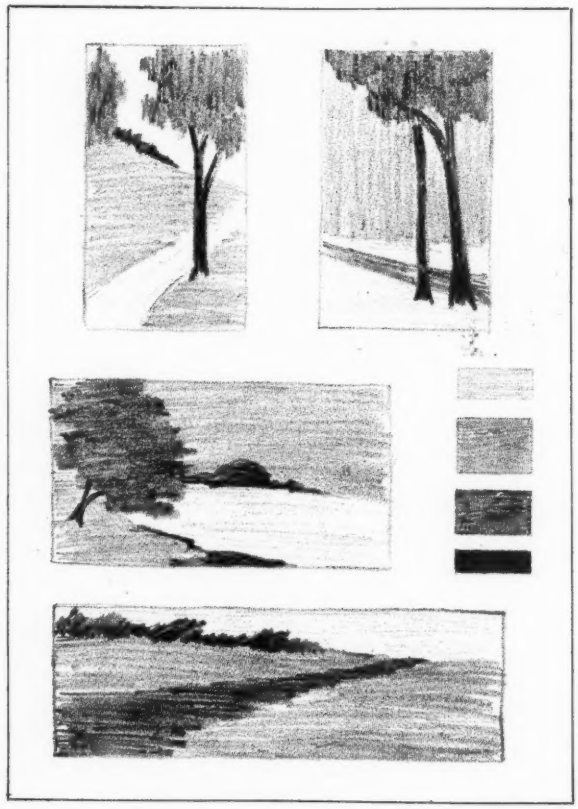


Plate 2.

Next, each selected the picture which pleased him best, and with charcoal made a simple reproduction of the masses, noting at one side the particular values used, and the relative quantity of each in the space (Analysis of Values, Plate 1); and then each tried to recompose these values into a composition of his own. To lessen the tendency to reproduce the picture before him, a composition of a different shape was required. There are always some who will even then reproduce the original picture, and this is not wholly a misfortune, as in class criticism it is at once perceived that these are failures in the new shapes; thus bringing up anew the matter of the absolute relation of space-breaking elements to the proportions of the enclosing space. Further, to avoid confusion the material was slightly limited, that is no buildings allowed, lest too many questions of perspective submerge the main problem. (Plate 2.)

Each pupil made a page of small landscape notes involving the tones obtained by analysis, and then followed a class criticism. This brought out certain facts about the placing of the horizon line; the effects produced by raising or lowering, and the greater difficulty of obtaining a good composition with the line in the center of the space; and a discussion of perspective in so far as it affects sizes and the convergence of lines of roads, etc. The class picked out the ones which they found most pleasing as pictures, and a little discussion of these and a comparison with the original photos or prints developed the importance of certain elementary laws of composition which had consciously or unconsciously been obeyed; the center of interest, dominating masses and auxiliary spottings, balance of light and dark.

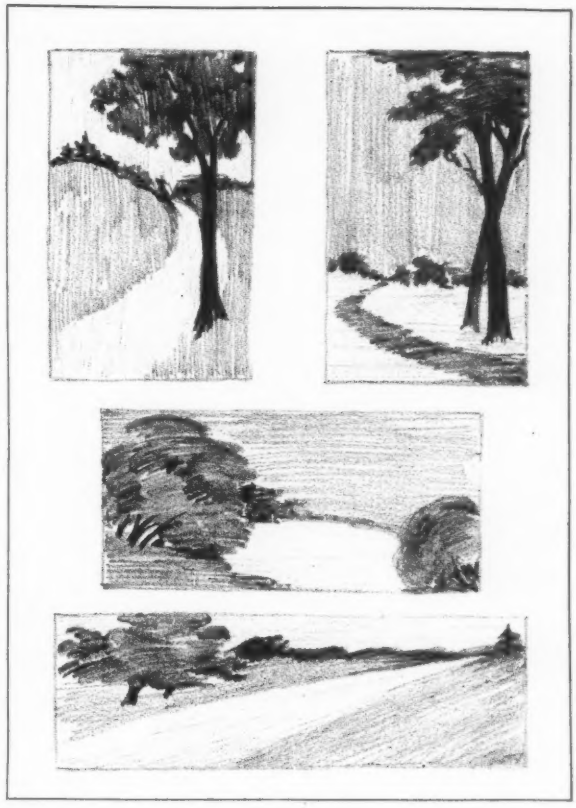


Plate 4.

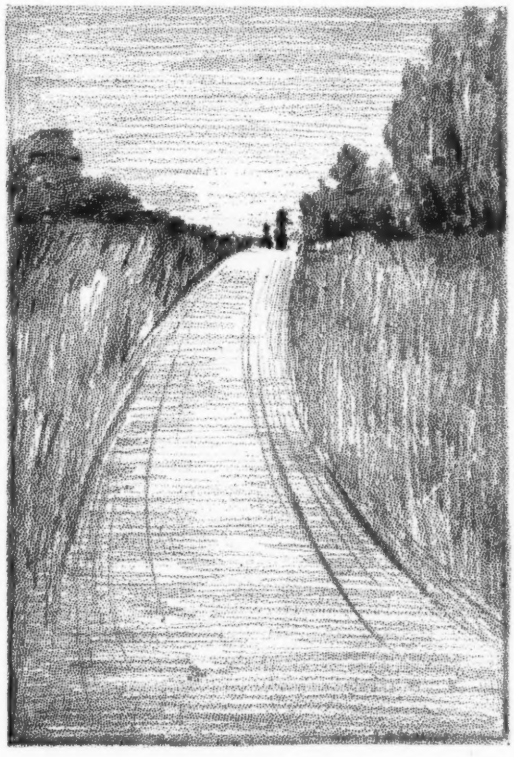


Plate 3.

They appreciate the reasonableness of these relations just as they appreciate in their literature the relation of the dominating plot and the subordinate anecdote and episode; and some comparison of this sort gives them a more intelligent comprehension of pictures in general. These, even dimly perceived, give the pupil a clue for further work and to make progress seem possible and inviting. One of the most satisfactory specimens for helping them to this point in these classes was a very attractive little photograph, of about the arrangement indicated in Plate 3. When asked what part of this picture they found themselves looking at most persistently, the answer was prompt—"The top of the road." Other questions as follows: "Why?" "Because there are people there" was one of the answers. Here the experiment was tried of placing those little figures against the trees to the right or left, or in the somewhat darker foreground of the road, with the result that the figures were practically lost, while the eye still sought the top of the road, tho not quite so strongly. This proved that it was not because there were people there, but the conclusion was soon reached that the eye was attracted there because of the strong contrast of light and dark and the place of line in that direction (edges

Plate 5.

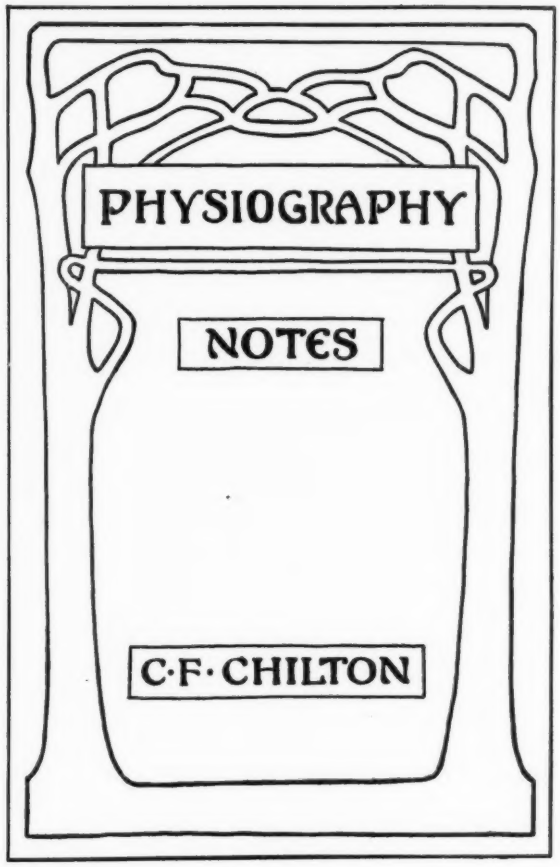


Plate 6.

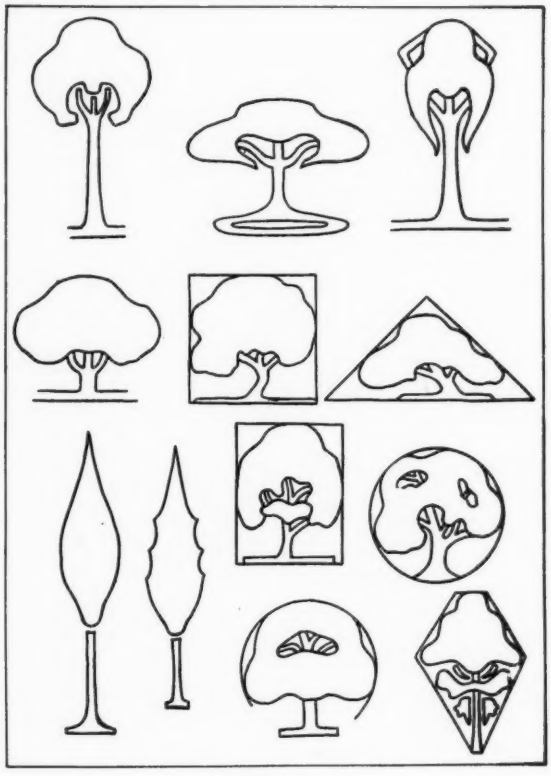


Plate 7.

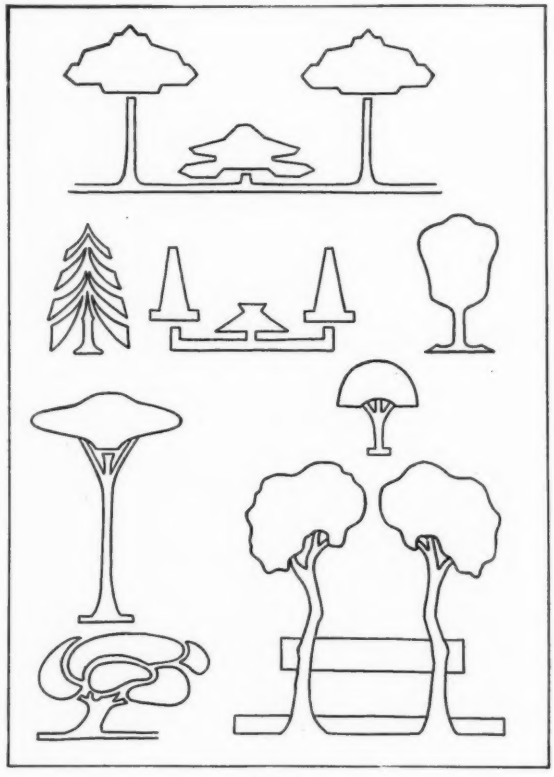


Plate 8.

of the masses of trees and lines of the road), and that the dark figures add an interesting touch of detail.

Returning again to the pages of their notes and especially considering a number of the unsuccessful papers, the class was asked to suggest improvement. This gave them a chance to directly apply the discoveries just made and to make the corrections of their own work more sure. When the chance was given the calls came fast—"No center of interest," "Too crowded in space," "Too much dark for the light;" while before the tendency had been to say, "Couldn't tell what kind of a bush or tree," or "Road not drawn right." *The larger perception had been substituted for the smaller one.*

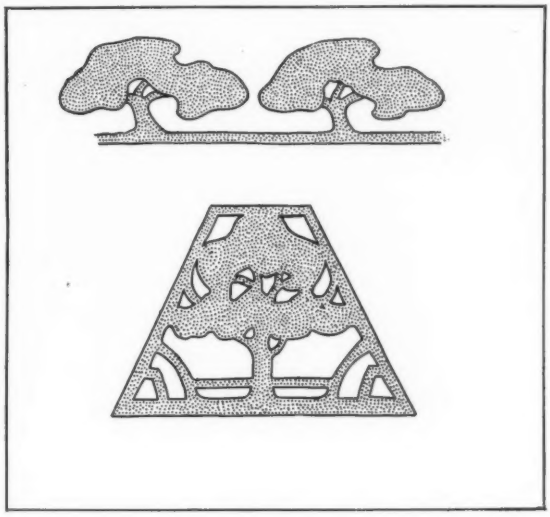


Plate 9.

This may seem too much like diagraming a process into which "feeling" and artistic intuition must enter to give the most valuable results, but it has the virtue of giving definiteness to a problem which otherwise will be so illusive as not to hold the interest of the average pupil without special opportunities or training at this age. The knowledge of these elementary principles and the application of them in such problems as may be possible for him, will not make him an artist but it will give him a keener interest in and a more intelligent appreciation of some phases of art, and it will make this form of art expression more definitely available for his use; and certainly it cannot retard the development of any artistic tendencies he may happen to possess.

This class criticism was followed by a chance to correct drawings or to make new ones, and a very great gain in power was shown to have resulted. (Plate 4). When a reasonable understanding of and facility with these simple phases of composition was reached, we passed to the next step.

First there was a more careful drawing of the masses, whose size and placing had been the chief

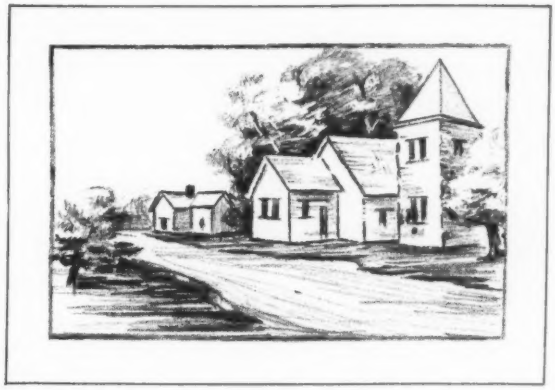


Plate 10.

concern before. Sometimes studies of trees can be made from school window, sometimes pupils can bring them in, but in any case there should be a reserve supply of material in pictures from which the teacher can furnish the necessary types, and when this experimental work has been done for a short time, the compositions may be again corrected for good drawing.

In the study of trees as in flower form, the pupil must be directed to the character of line in the different types. (Plates 6 and 7, Plant Study).

Interpretation in Line.

The pupils were then asked to reduce to line the tree and shrub forms in their pictures—partly for

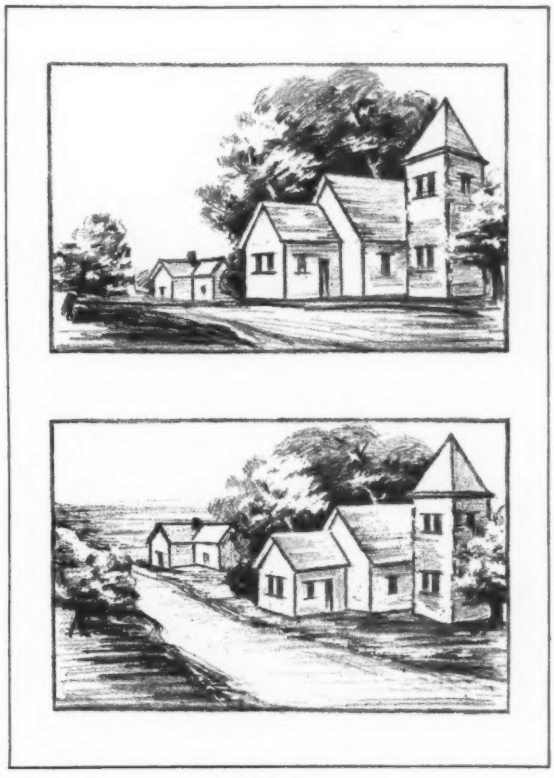


Plate 11.

the very definite kind of thinking this involves and which makes it a sure means of fastening the form in their minds—thus enlarging their vocabulary of such symbols. If there is time to have each pupil treat several contrasting types in this way, he is that much the richer. Further, the rendering of this entire composition in line, will sometimes immediately reveal to him the poverty or crudity of it and set him to work in a new direction, i. e., the refinement of line and the recognition of rhythm of line in nature and pictorial and decorative composition.

Decorative Treatment.

These classes followed the pictorial work by study of the pattern of the tones and shapes used and to render it as effectively and simply as possible. In this class each pupil reduced his pictorial composition to a smaller number of flat tones (from five or four to three or even two—the silhouettes).

Then with the same compositions reduced to line, experiments were tried in changing relations of the lights and darks; and the quality of lines to be emphasized or submerged, became very obviously a potent factor in the result. Many became quite as much interested in finding out whether the general shape of a mass of trees looked best in sharp silhouette, or whether the including of the cast shadow in same general group gave a better line—as they had been in the original production of a picture which was more or less story-telling.

After these experiments they were asked to produce two tone arrangements which were decorative and at least one of these was carried into a problem involving the spacing of a page—and lettering, there were some title pages for physiography note books—some posters—some carefully lettered selections from the pupils' English work—with this decoration used in a somewhat illustrative way (Plates 5 and 6.)

The class had opportunity to examine a number of Japanese prints—during this work—as the best available examples of decorative flat tone treatment. When time permitted, additional application of this material was made in line and color. (Plate 6.)

Adapation to Design.

This resolved itself into a direct conventionalization of nature forms, chiefly tree and shrub—and the method followed was that of first reducing the pictorial form to symmetry by eliminating irregularities, thus producing rather naturalistic units, then translating these into round lines and then angular lines, then trying the change of dominant direction in the unit (vertical, horizontal, oblique, and last the change in dominant proportion in these directions. Plates 7 and 8). Good results were obtained by relating tree forms to various geometrical shapes until the classes were quite free in their adaptation of such forms to the needs of special cases.

Application of these followed in page decorations—title pages—or head and tail pieces—in designs suitable for leather, metal or textile craft, attention being called in examining the variety of units to the greater suitability of certain ones to special materials; for instance, the suggestion of weaving or needle work so easily gotten in some of the angular treatments, and the greater difficulty presented by the absolute sharp angles for metal decorations. (Plate 9.)

This order of work, forcing them to see many elements in one subject, results in arriving rather early at a broad comprehension of the wealth of material for decorative use always at hand, and the freedom with which it may be made to serve. Further, the fact that the various elements were so separated that the mind was concentrated on one at a time, avoided a discouraging confusion.

After one or two compositions worked out in this way the pupil begins to hold many things unconsciously in mind, and to possess a new set of tools thru which his ideas may find increasingly satisfactory expression.

As the high school work progresses the classes will, of course, become familiar with more complicated forms of composition, which, however, need not be analyzed too far, once the point is made that much of their beauty depends upon the three great elements of fine line and spacing, pleasing pattern of light and dark, and harmonious color.

Perspective.

The general familiarity of the pupils with landscape makes it one of the best means of approaching perspective, gathering up and emphasizing known facts of appearance as a means of easy transition to the next to be mastered. Therefore, each pupil made a composition similar to the ones just completed, but this time with buildings required as a prominent part of the material, and as soon as fairly started the drawings were put up for class criticism. Their discoveries and suggestions were made the basis of profuse illustration, by use of some of the class drawings, by sketches on the blackboard, by views out of the window and by pictures. Every opportunity should be taken to show them good reproductions of good work, and to gradually familiarize them with those who contribute to this great general store house, especially those whose work is accessible in local galleries or magazine reproductions. For this particular work they find much interest in the pictures of Jules, Guerin, Joseph Pennell and Colin Campbell Cooper.

Objects inside the room were constantly introduced as illustrative material, the larger pieces of furniture, projecting corners, etc., as related in type and position to the buildings, telegraph poles, rows of trees, etc., of the picture; and the smaller objects, books, boxes, tables, chairs, type solids, generally seen below the eye level, as presenting the same conditions as the steps, platforms, porches, etc., in the pictures. As the perspective of circles is easily introduced under plant study so this appears to present

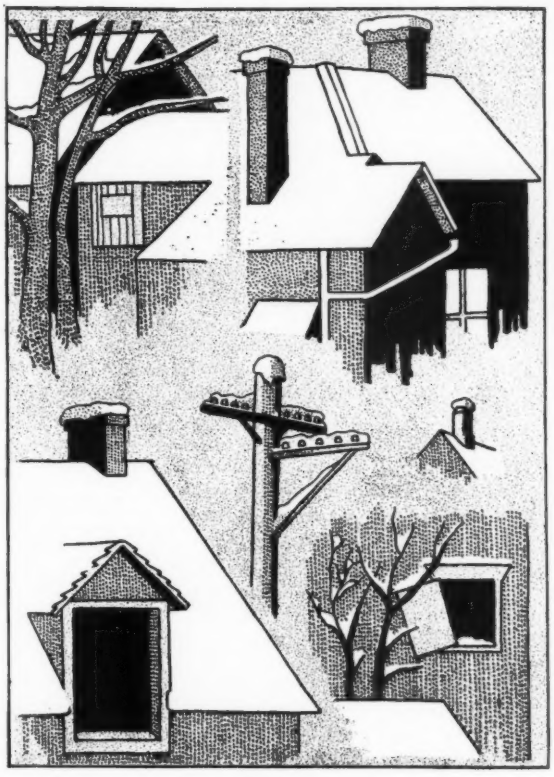


Plate 12.

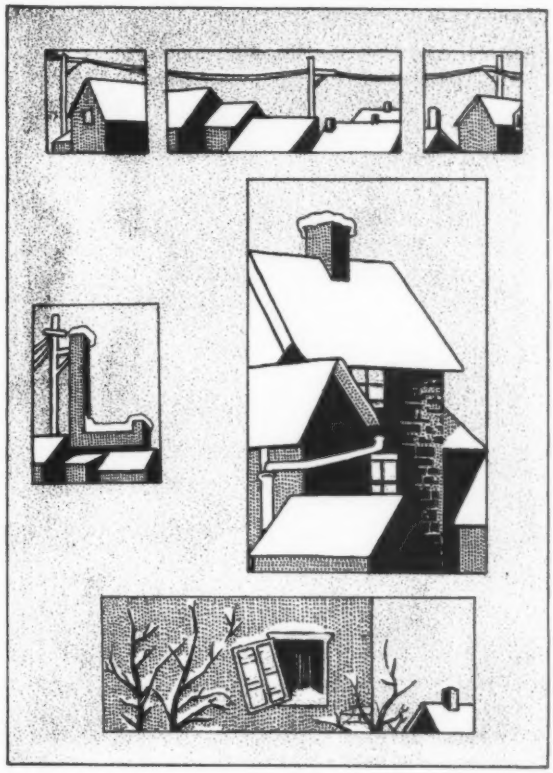


Plate 13.

an excellent chance of relating these things—by illustration at least—to the object drawing to follow later.

After their drawings were corrected each pupil made a number of quick sketches reproducing the same composition with variations in the height of the horizon line and the resulting changes in direction of line and implied point of view. (Plate 11.)

An interesting application of this might be made by requiring an illustration to be made for some English work, or for some "word pictures" from other sources, using either pictorial or decorative treatment. One class showed great interest in compiling a perspective portfolio, designing and lettering an appropriate cover, and keeping in it a collection of examples made from their own classroom work, and clippings made from magazines and advertisements.

Another class made a page of small sketches of such fragments of roofs, chimneys, etc., as could be seen from the school window. (Plate 12.) Later, these were put to somewhat decorative uses, as initial letters, head and tail pieces, etc. (Plate 13.)

This subject was more fully taken up under object drawing, where variety in point of view can be so easily obtained, and where ease in handling the objects insures the added "sense of structure" as an aid to depicting its appearance. The passing reference to objects in connection with this phase of perspective serves as a definite introduction to its further and more detailed study in connection with still life.

Some Simple Fruit and Vegetable Evaporators

Fred P. Reagle, Montclair, N. J.

EARLY last spring when it was evident that the United States would be drawn into the great World Conflict, and after our declaration of war against Germany, the country was more or less panicky on the food question. The evident national concern in regard to this most vital war need was apparent to all and its increasing importance impressed every thinking person, and as never before in our history men and women were thinking of ways to help.

The conditions of stress were due to a combination of conditions chief among which may be named the following:

1. The probable bumper output, the country over, of all crops of fruits and vegetables due to the unprecedented advertising campaign among farmers and civilians to plant as never before.

2. The promised shortage in our supply of metal and glass containers for the canning factories and for private use, due to the great demand and probable shortage of labor and materials.

3. The early prediction of a very serious short-

Fig. 1. The Evaporator is raised or lowered over stove whether stove is in use for other purposes or not.

Fig. 2. Single tray can be used in the oven of a gas or coal stove.

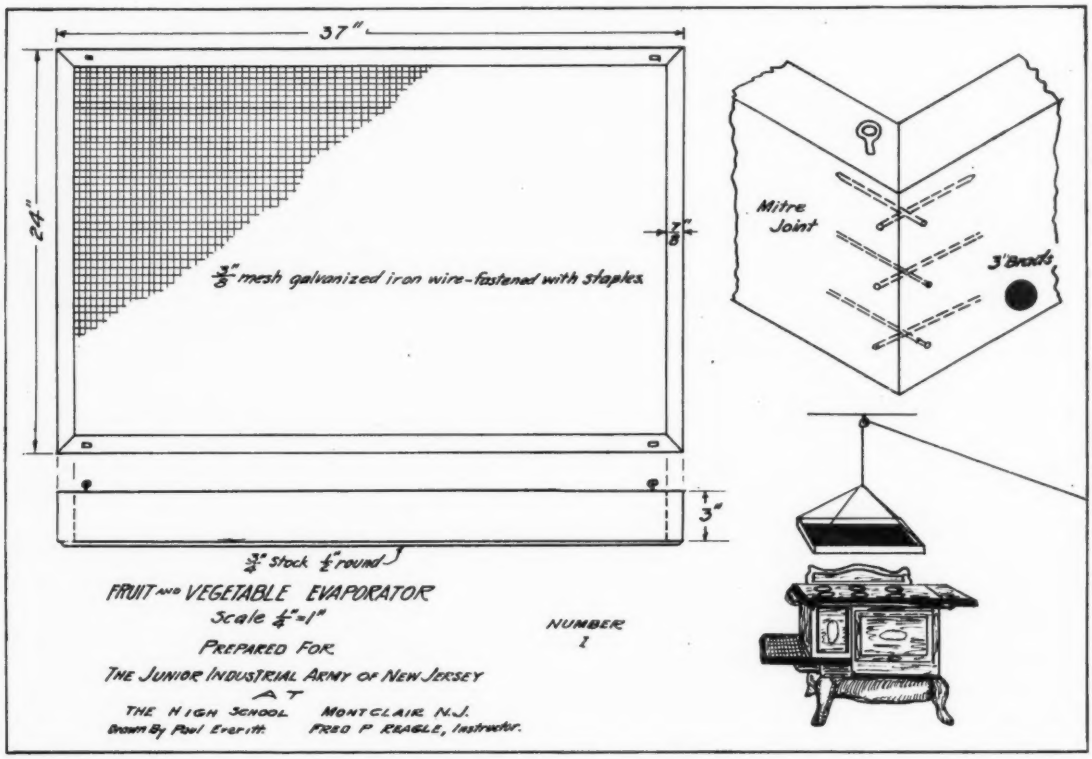
Fig. 3. Double tray can be used in the oven of a gas or coal stove. Contents are mixed by turning over from time to time.

age in the sugar crop, due to our duty in supplying the Allies with that commodity and a probable short crop in Cuba and elsewhere.

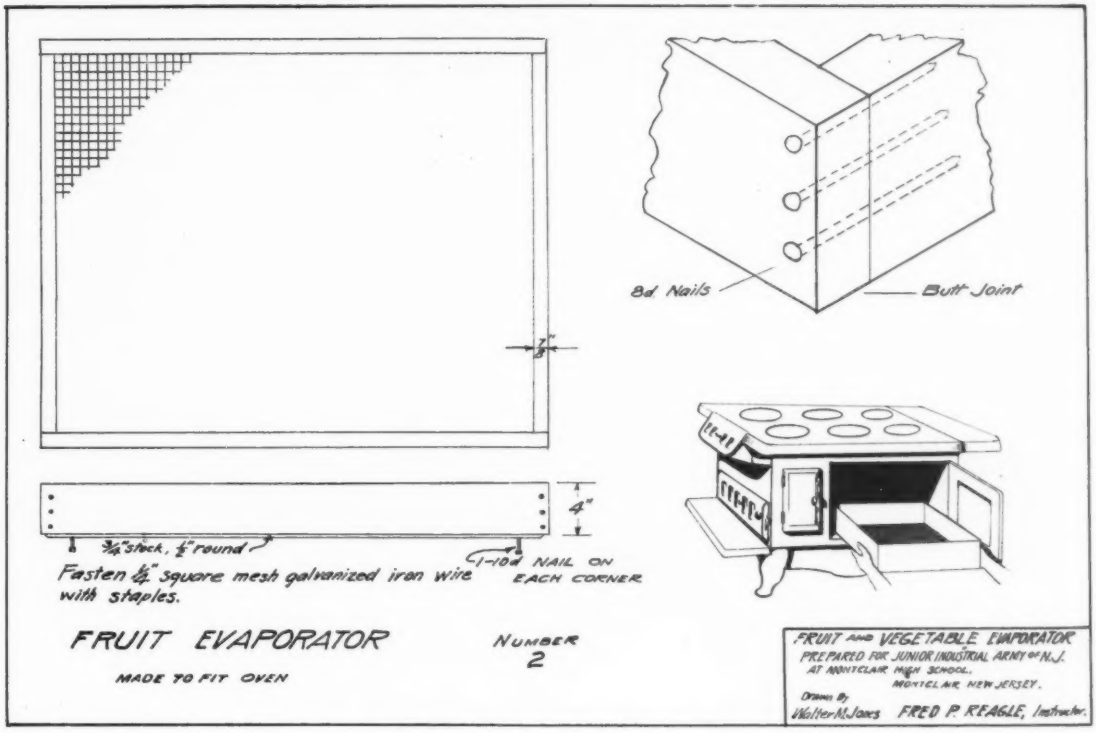
These conditions seemed to forecast in the summer and fall a large waste of fruits and vegetables and to prevent this people all over the country were turning, in the emergency, to facilities for drying or dehydrating succulent crops.

As part of the work of the Junior Industrial Army of New Jersey and at the suggestion of the State Department of Education at Trenton, the writer was designated to look up this new or possibly lost art and, if possible, design some simple evaporators and driers, such as could be made in the manual training shops of the state.

To secure information hurriedly on this subject



DETAILS OF EVAPORATOR NO. 1.



DETAILS OF EVAPORATOR NO. 2.

as early as last March or April was a difficult matter as no really definite knowledge in book or pamphlet form was available. Wherever application was made we found people likewise looking for it and all uncertain about past results. The New York Public Library and numerous large technical libraries had little or nothing to offer.

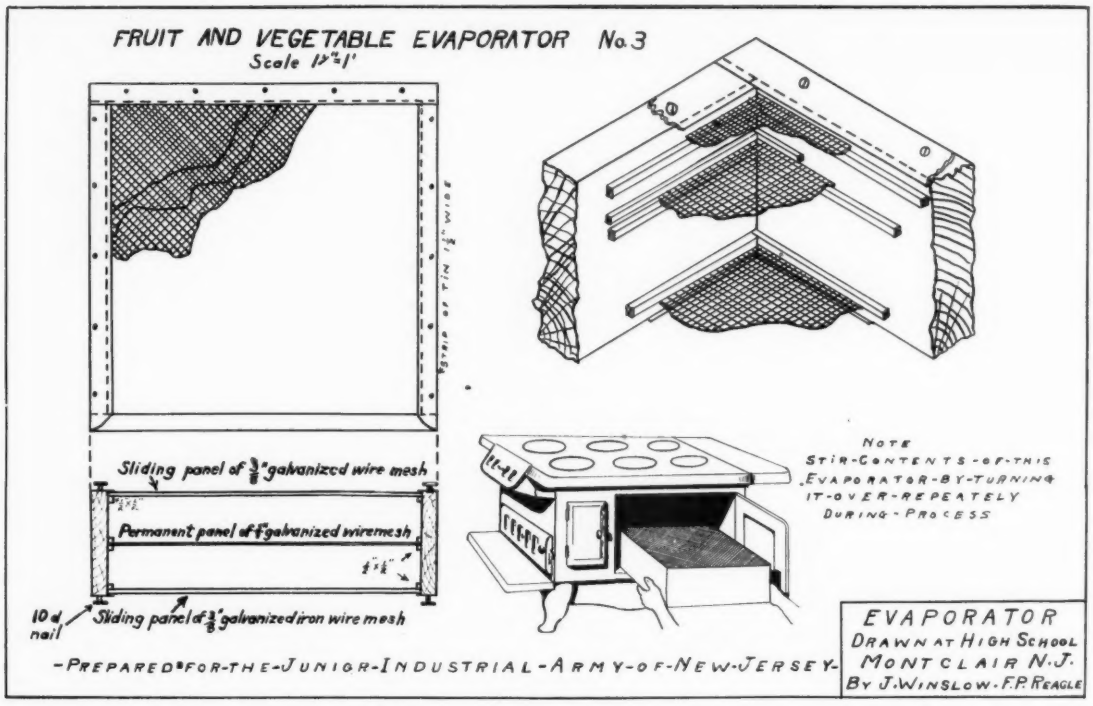
True enough, for years we have had in Western New York, Canada, along the lakes and in a few states, large commercial evaporating plants which made use of artificial heat. But these establishments, at least up to the time of the outbreak of the war, had been working largely on apples or small fruits and had little to offer in helping to solve the problem set up in this brief sketch except to show the process as carried out on a large wholesale basis.

Our problem was to devise means of evaporating fruits and vegetables using the heat of the sun or of a gas or coal stove or any other source of heat available in homes, and possibly a small community evaporator having a heating plant of its own which could be moved around from place to place and burn wood or coal.

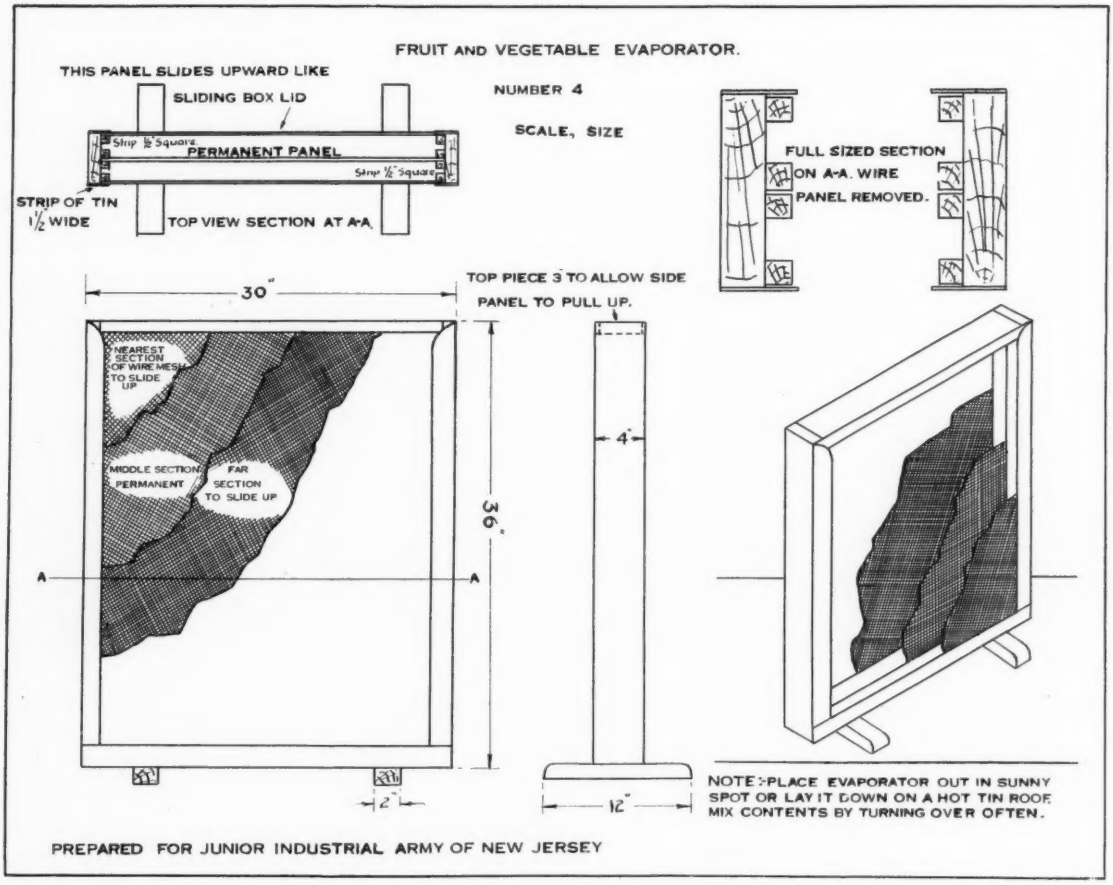
During the past summer and fall much literature had been issued on this subject of food preservation and many experiments had been tried out. The national government, many states and state universities have sent broadcast the results of these investigations and experiments and numerous inexpensive evaporators have been put on the market by commercial houses.

Believing that, if the war continues during another year and even if it does not, the food question will be much more serious than ever before, these drawings and pictures, together with the directions for using the driers, are here offered in the hope that

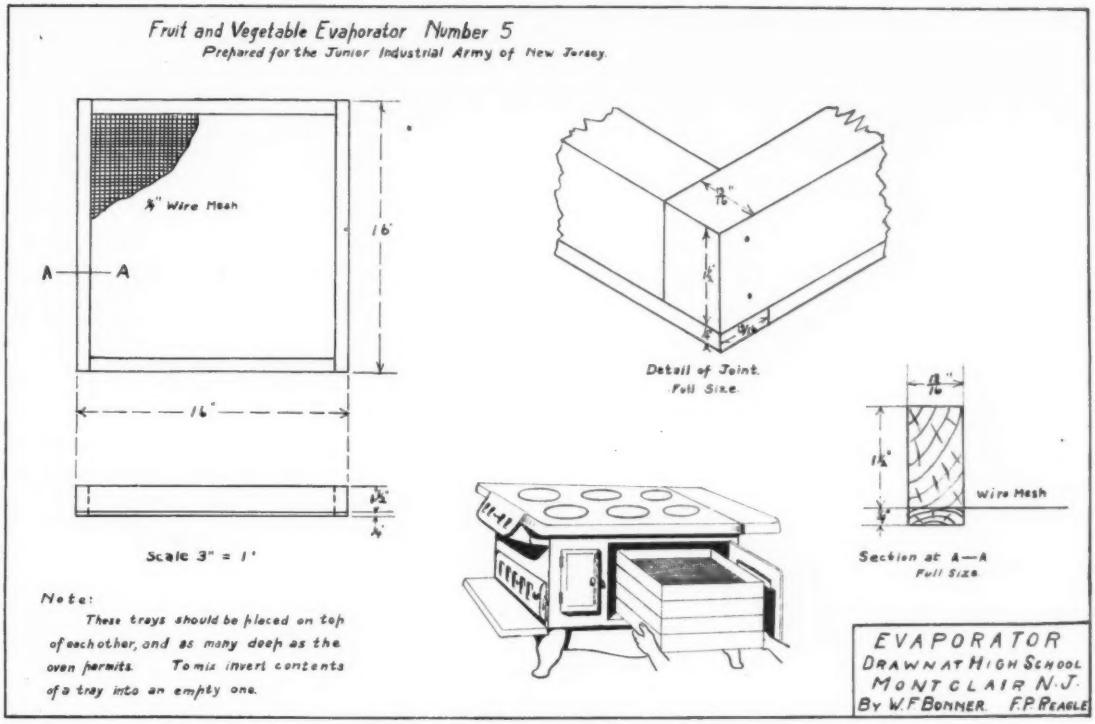
Fig. 4. Evaporator No. 5 in Use. Stack of trays to fit oven. To stir contents place empty tray over full one and invert.



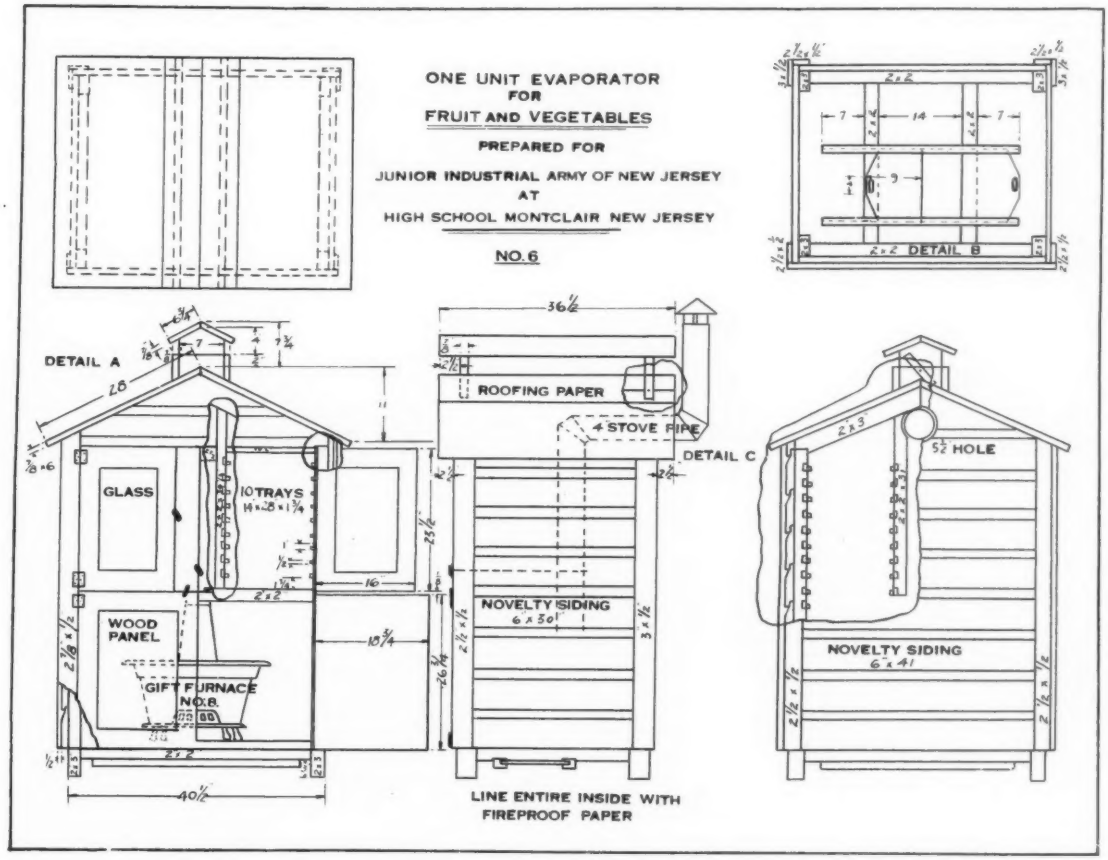
DETAILS OF EVAPORATOR NO. 3.



DETAILS OF EVAPORATOR NO. 4.

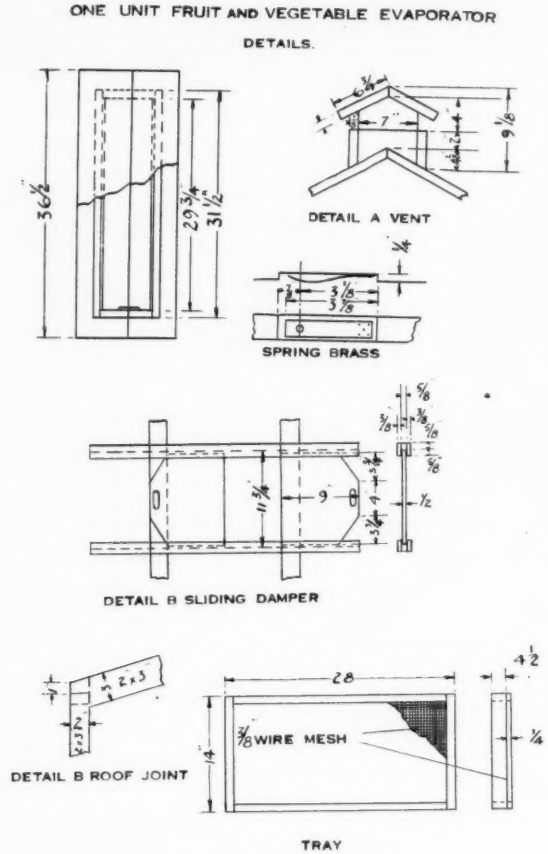

Fruit and Vegetable Evaporator Number 5
Prepared for the Junior Industrial Army of New Jersey.
¼" Wire Mesh
16"
A — A
16"
Scale 3" = 1'
Detail of Joint.
Full Size.
Wire Mesh
Section at A—A
Full Size.
Note:
These trays should be placed on top of each other, and as many deep as the oven permits. To mix invert contents of a tray into an empty one.
EVAPORATOR
DRAWN AT HIGH SCHOOL
MONTCLAIR N.J.
BY W.F. BONNER. F.P. REAGLE

DETAILS OF EVAPORATOR NO. 5.



DETAILS OF EVAPORATOR NO. 6

(See also Pages 150 and 151.)



Details of Evaporator No. 6.

the school shops of the country will *do their bit* by making some of them for home or community use, or that by procuring some or all of the publications mentioned in the bibliography at the end of this article they will exert their ingenuity and develop something much more worth while.

These drawings and tracings were prepared by boys in the Montclair High School mechanical drawing classes. The blue prints were made in the Essex County Vocational School, West Orange, which, together with the directions for using the machines, were in the hands of the Junior Industrial Army of New Jersey at Trenton by June 5, 1917.

During the last session of the State Summer School at Ocean City, New Jersey, July, 1917, each of the driers shown was carefully tried out, using fruits and vegetables, ripe and available at that time. Apples, berries, potatoes, cabbage, onions, beets, and carrots were prepared, dried, and put up in air tight containers. The community machine No. 6, burning pea coal, was able to perform the operation of converting green product to its bone dry stage in one of the six-hour sessions of the school.

Following are the directions prepared for distribution in the state with the blue prints mentioned above:

Junior Industrial Army of New Jersey.
Directions for Use of Simple Evaporators.

These simple evaporators, Numbers 1, 2, 3, 4, and 5, should be used as indicated in the perspective sketches on the drawings. They are meant to be used over a gas or coal stove, or in the oven of the same. Number 1 should be raised and lowered over the top of the stove whether the stove is used for cooking purposes or not. Numbers 2, 3, and 5 are used in the oven of a gas or coal stove. Number 4 is meant to be stood up out in the sunlight and air or to be laid flat on a hot tin roof.

Number 6.

The portable community evaporator, illustrated as Number 6, is not a new or original design. It is new and original, however, in the shape in which it appears here. It should dry down from six to eight bushels in a day of eight hours. The trays should be moved around from time to time, those drying most rapidly being placed farthest from the stove. As the process continues the centers of numerous trays may be emptied into one, thus freeing trays for raw product. The adjustable cold air inlet under the stove, and adjustable hot air outlet in the ventilator on top, enable the operator to control the temperature and movement of air thru the evaporator.

Great care should be taken in using these evaporators not to work at too high a temperature. It is rather dangerous in general to get above 150°, as baking or cooking starts very soon above that. Try to use sufficient heat and a good circulation of air so as to dry the product in a minimum time.

The product during the process should be stirred or mixed from time to time. This can be accomplished by turning the contents of one evaporator over into another one, or by turning the evaporator upside down as in the case of Numbers 3, 4, and 5.

A few detailed directions on the preparation of vegetables and fruits will be helpful.

Spinach and Parsley.

Spinach that is in prime condition for greens should be prepared by careful washing and by the removal of leaves from the roots. Spread the leaves on trays to dry thoroly. They will dry much more promptly if sliced or chopped. Dandelions and other greens may be dried in the same way.

Beet Tops, Swiss Chard, Celery, Rhubarb.

Beet Tops: Tops of young beets in suitable condition for greens should be selected and washed carefully. Both the leaf, stock, and blade should be cut into sections about $\frac{1}{4}$ inch long and spread on screens and dried.

Swiss Chard and Celery should be prepared in the same way as beet tops.

Rhubarb: Choose young and succulent growth. Prepare as for stewing by skinning the stalks and cutting into pieces about $\frac{1}{4}$ to $\frac{1}{2}$ inch in length and dry on trays.

All the products under this heading should be conditioned as described.

Raspberries.

Sort out imperfect berries, spread select berries on trays and dry. Do not dry so long that they become hard enough to rattle. The drying should be stopped as soon as the berries fail to stain the hand when pressed. Pack and "condition."

Garden Beets, Onions, Carrots, Turnips, Parsnips, Cabbage.

Beets: Select young, quickly grown, tender beets, which should be washed, sliced about $\frac{1}{8}$ of an inch thick, and dried.

Turnips should be treated in the same way as beets.

Carrots should be well grown but varieties having a large, woody core should be avoided. Wash, peel, and slice crosswise into pieces about $\frac{1}{8}$ of an inch thick.

Parsnips should be treated in the same way as carrots.

Onions: Remove the outside papery covering. Cut off tops and roots. Slice into $\frac{1}{8}$ inch pieces and dry.

Cabbage: Select well developed heads of cabbage and remove all loose outside leaves. Split the cabbage, remove the hard, woody core, and slice the remainder of the head with a kraut cutter or other hand slicing machine.

Corn.

Corn: Boil green corn on the cob in a large boiler five minutes, adding one tablespoon of salt to two gallons of water. Cut the corn from the cob. Spread out on paper covered driers made of heavy wire or strips of wood. Place in the oven or in the sun to dry. Stir frequently. When dry store in heavy paper bags and keep in a dry place.

Conditioning.

Dried products should be packed temporarily for three or four days and poured each day from one box to another to bring about thoro mixing, and so that the whole mass will have a uniform degree of moisture. If during this "conditioning" any pieces of the product are found to be too moist they should be returned to the trays and dried further. When in condition the products may be packed permanently in tight paper bags, insect proof boxes or cartons, or glass or tin containers.

Bibliography.*

Bulletin 13, Department of Agriculture, Charleston, W. Virginia.

Bulletin 14, State College for Women, Tallahassee, Florida.

Bulletin 5, New York State Food Supply Commission, Albany, N. Y.

*This bibliography is not a complete one on the subject. It is a partial list of the material in the files of the writer at the time of the preparation of this article.

Fig. 6. Community Evaporator
Artificial heat (coal or wood). Capacity, 6 to 8 bushels.
Set up in school yard, Ocean City, N. J.

Farmers' Bulletins 291, 841, and 903, U. S. Department of Agriculture, Washington, D. C.

This War Must be Fought in the Kitchens as well as in the Trenches, State of New Jersey, Department of Public Instruction, Trenton, N. J.

Suggestions for the Progressive Evaporator and Canner, Coons-Mabbett Mfg. Co., Inc., Rochester, N. Y.

Save Your Fruit and Vegetables with a Granger Fruit and Vegetable Evaporator, The Grange Sales Association, Philadelphia, Pa.

The Evaporator, (a magazine) issued monthly by the Webster Printing Company, Webster, N. Y.

BILL OF MATERIALS FOR EVAPORATOR NO. 6.

Material	*No.*	*Thick*	*Wide*	*Long*	*Remarks*
Pine	4	2″	3″	2′	Roof
Pine	4	2″	3″	4′ 7″	Corners
Pine	2	2″	2″	3′ 1½″	Stove
Pine	2	2″	2″	2′ 2″	Stove
Pine	18	⅞″	6″	2′ 6″	Novelty Siding
Pine	12	⅞″	6″	3′ 8″	Novelty Siding
Pine	2	⅞″	7″	3′ ⅛″	Top of Vent
Pine	2	⅞″	7″	8½″	Ends of Vent
Pine	2	⅞″	4½″	3′ ⅛″	Sides of Vent
Pine	8	⅞″	7″	3′ ⅛″	Roof
Pine	2	1″	2″	14″	Door Frame
Pine	4	2″	2″	2′ 7″	Tray Racks
Pine	1	2″	2″	7″	Tray Racks
Pine	1	2″	2″	2′ 11″	Tray Racks
Pine	2	¾″	4″	2″	Tray Racks
Pine	40	¾″	1″	28″	Tray Racks
Pine	40	¾″	1″	28″	Tray Racks
Pine	2	¾″	2½″	4′ 10½″	Corners
Pine	2	¾″	2½″	4′ 9″	Corners
Pine	2	¾″	3″	4′ 9″	Corners
Pine	2	¾″	2½″	4′ 10½″	Corners
Pine	2	1½″	1½″	2′ 8″	Slide Damper
Pine	2	¾″	9″	11⅛″	Slide Damper
Pine	1	¾″	6½″	2′ 5½″	Damper in Vent
Pine	2	2″	3″	1′ 10″	Roof
Pine		¾″	3″	21′	Doors
Pine		¾″ molding		9′	Glass
Pine		4 sq. ft. paneling			Doors
Glass	2	⅛″	9″	12⅛″	Doors
Latches	4 Wood Blocks				Doors
Galvan. Iron			3′ 6½″	x 2′ 7½″	Under Stove
Stove Pipe	54″ x 4″ dia.				
Elbows	2	4″ dia.			
Sheet Iron	1	18″ x 14″			Connect Stove
Roofing	13 sq. ft.				
Asbestos Paper					
Collar	1	4″			Stove Pipe
Rain Cap	1				Stove Pipe
Spring Brass	3½″ x ½″				Damper
Hinges—4 pair		2½″			Doors

Stove Gift Furnace No. 8, Union Stove Works, New York City.

INDUSTRIAL-ARTS MAGAZINE

Board of Editors

WILSON H. HENDERSON . . . Washington, D. C.
E. J. LAKE . . . . . Champaign, Ill.
S. J. VAUGHN . . . . . DeKalb, Ill.

EDITORIAL

WAR AND EDUCATION.

THE occupations of war are far more numerous than even our experts in war could have surmised a year ago.

Not only are a large proportion of students of our professional schools engaged as soldiers and sailors but the faculties of these schools are depleted in almost equal proportion by the demands for expert service in the problem of putting a great army and navy into operation.

Engineering, scientific, commercial and agricultural experts would be expected in the nature of things to take part in modern warfare, but who would have predicted that linguists, historians, artists and psychologists would be in demand for war service.

At the present time experts in each of these branches of school study are busy in the national service relative to the war.

Linguists are carrying on and interpreting correspondence between allies of many tongues. Historians are seeking evidence on which to base international justice. Artists are creating public sentiment by graphical illustration and deceiving the enemy by camouflage. Psychologists are applying their observations of the mind to the selection of candidates for military and naval service and to the interpretation of abilities that must not be left to chance.

It is exceedingly gratifying to school administrators that the schools must be called upon and can be of indispensable service in this great emergency.

What will be the ultimate result of this recognition of school efficiency?

We predict that school training will be found efficient beyond general prediction. We predict that school training will be found weak, trivial and formal in the direction of the industrial arts. Already there is heard the lament that we have no adequate number of expert mechanicians and tradesmen to carry on the work in hand. When the schools are appealed to for trained mechanicians and tradesmen or for the immediate organization of instruction in these practical arts they respond generously but acknowledge that they are equipped for the training of professional engineers, professional agriculturists, professional everything but not for the training of expert workmen.

We predict a new interpretation of Democracy in education or of education for Democracy. This new Democracy will put upon the schools the responsibility of identifying and developing the various and specific talents of the many, rather than to maintain a school organization that puts a premium on the choice of a professional course of study, for which the individual is not capable.

SOME FALSE FRIENDS OF VOCATIONAL EDUCATION.

LET no one imagine that the fight for vocational education closed with the passage of the Smith-Hughes Act or with the acceptance of it by the various states. The standpat reactionary is still with us and is as busy as ever but in a different direction. He has discovered that it is not good politics for one in public life to oppose vocational education, so his next step is obviously to *get control* of it.

In some of the states, reactionary, politician State Superintendents of Public Instruction who have heretofore persistently, but insidiously, opposed vocational education, have now managed to have themselves made executive officers of their state boards of vocational education. Some of these "public servants" have already announced their candidacy for re-election. Seeing the trend of public opinion, these politicians are now beginning to go over their states talking on vocational education, a subject about which they know absolutely nothing and care less.

False friends are perhaps the most dangerous foes that vocational education has today. Those State Superintendents who have for years shown no interest whatever in the promotion of vocational education are not friends of such education, regardless of what they may say in their political announcements.

It is the duty of all friends of real vocational education to make every possible effort in the coming elections to supplant such reactionary officials with fair minded officials who will at least see that vocational education has a fair chance of success. Failing in this, the next duty will be to go before the state legislatures and ask for such modifications of the state plans as will eliminate reactionary and obstructing officials from the control of vocational work.

FUNDAMENTALS IN ART.

THE disturbed condition of art instruction in our schools is a matter of deep concern to all who realize the vast importance of the work. Mr. Farnum expresses this concern in his interesting article, "What of Art Education?"

The temporary disturbance of school work by war conditions is to be regretted. So also is the disturbance of school work by contentious advocates of extreme and untried theories to be regretted and counteracted by teachers of experience. Art seems especially subject to revolution. The history of art is the record of a series of revolutions against formulated and established practice. Indeed, tho most of

us are ready to disclaim understanding of art, we each reserve the divine right to select and pronounce that which we like best.

Our school executives hold a peculiar view of art instruction.

Most of them are ready to pronounce it of very great importance in the general scheme of education but are satisfied to know less about the content and method of instruction in art than in any other school subject. The school official who holds convictions on how art should be taught is as great a curiosity as the school official who does not have convictions on just how to teach the other school subjects.

The makers of texts and equipment for art instruction presume to have convictions that the materials they produce are based upon the last word in method and content for art instruction. One who has observed common-school art instruction in America is convinced that the influence of these makers of texts and equipment has been a large factor in promoting art instruction. Much of this influence has been directed toward effective instruction. Some of it has been directed toward the sale of goods thru the emphasis of extreme rather than fundamental conceptions.

In reply to the question, "What of Art Education?" we can agree on the purpose to establish in the minds of pupils certain fundamental conceptions of beauty. Our school art instruction has failed to do this essential thing. Our pupils have not arrived at that synthetic vision which is the basis of judgment in art. They do not see in terms of related form and color in which beauty is expressed. We believe there are several, and perhaps many, reasons for this failure. Perhaps the most important one is the lack of fixed purpose in the mind of the teacher.

Teachers have undoubtedly attempted too much. They have attempted to cultivate skill in the use of a variety of mediums and materials.

They have attempted to develop originality by putting a premium on unique and eccentric effects rather than on simple, orderly arrangement.

Proportion, balance, arrangement, tone, value, harmony have been neglected.

These essential elements of art can be realized and appreciated thru observing and studying good examples. This observation and study can be carried on most effectively by drawing, modeling and painting in emulation of good examples. Precept alone is not adequate. Originality is not so important as appreciation in art education; therefore examples of the best art must be available for study.

Drawing, painting, modeling and design are but means to the end of understanding and appreciating beauty, and we are convinced that they are the best means to that end.

MEETING THE NEED FOR TEACHERS.

MR. WM. E. ROBERTS, Supervisor of Manual Training, Cleveland, Ohio, is attempting to solve the problem of loss of teachers thru war service in a very interesting way. Many of the grade centers for manual training have had to close, and Cleveland boys, like boys in most cities, are faced with the possibility of finishing their grade school work without manual training.

In Cleveland, 25 seniors in the technical high schools have been transferred to the Normal School for professional training with a view to teaching the shopwork in the grade centers. These young men, who were chosen because of their special aptitude and training in technical lines, will devote the remainder of the school year and also the summer term to this special preparation under the immediate direction of Mr. Roberts and his assistants. Next fall, they will take the places of the regular manual training teachers who have gone to war.

Arrangements have been made whereby the young men will be granted full credit on their high school courses for the special work done in the Normal School. Hence they will graduate with their classes in June just the same as if they had remained in the high schools.

Under the present stress and circumstances, this seems to be an admirable arrangement and undoubtedly will help to solve the problem as well as any plan thus far proposed. The experiment will be watched with great interest, and with the guidance that the Cleveland young men will have, their work need not be a failure by any means.

ASSOCIATION AIMS.

THE officers of the Associated Teachers of Shopwork, of the city of New York, have addressed an appeal to the members of the organization which deserves more than passing attention. Two paragraphs lay down fundamental principles of ethics that could hardly be stated more compactly and more effectively. They read:

"OUR AIMS—To be true and loyal to ourselves, to our profession, to our superiors in administration, to our city, state and nation, in thought, in word, in act, is our strongest desire; thus may we consistently endeavor to establish an ever-increasing degree of mutual respect and helpfulness.

"The Associated Teachers of Shopwork may well be proud of its desire to better exemplify the highest ethics of the teaching profession and to merit, at all times, the respect and consideration of its superiors and associates. The proper attitude with regard to our work together with the realization of constructive ideals will surely create and maintain the professional prestige which is the natural resultant of that attitude and which is envied of all professional men."

SCHOOL PROBLEMS IN WAR RELIEF WORK

Mr. Wm. S. Marten, of San Jose, Cal., has prepared a list of school problems which may be made in manual training and domestic arts classes for Y. M. C. A. stations and for the relief of suffering in European countries. The problems range from primary and intermediate grade work to grammar and high school problems.*

First and Second Grades—

Checker boards and checkers with envelope in which to put the checkers, or case in which to put both board and checkers. Boards made with woven strips, checkered wall paper or oil cloth mounted on cardboard or wood.

Cutting of paper dolls and making of envelope to hold same, these to be put in the pockets of the dresses of refugee children.

Scrap books of muslin and paper covers (suggested size 7″x9″) for the refugee children.

Cutting pictures from magazines and mounting them in scrap books.

Map and post card picture puzzles, with envelope or case to hold same.

Scraping lint and snipping and tearing scraps for comfort pillows.

Clipping cases of paper in which to collect news clippings and forward to the men at the front.

Knitting of small squares—such as 4″ for baby bootees or afghans, to be made up by older children.

Third and Fourth Grades—

Scrap books with paper or board covers for short stories, jokes and pictures. (Size suggested 7″x9″.)

Portfolios for stationery of heavy paper or cloth.

Address books to go with portfolio.

Calendar and blotter pads to go with portfolio.

Pin balls.

Needle cases.

Knitting needles of dowels or willow.

Map or picture puzzles with case or box to hold same. (This may be of thin wood or cardboard made with the coping saw.)

Dominoes, with cardboard box to hold same.

Checker board and men with case to hold same.

Solitaire board.

Cribbage score board.

Sewing problems for hospitals and refugees, as outlined in the Red Cross pamphlets.

Knitting problems such as baby bootees, wash cloths, squares for baby's afghans, caps, etc.

Gun wipes.

Grammar Grades and High School—

Sewing problems as suggested in A. R. C. pamphlets.

Knitting problems such as wristlets, mufflers, socks, etc. A. R. C. 400.

Packing cases for Red Cross, 24″x24″x36″ outside measurements, of wood ⅝″ or ¾″ thick (if for abroad, make end reinforced).

Reel for winding yarn.

Knitting needles. (See A. R. C. 400.)

Stocking knitting frame. (See Ind.-Arts Mag. Feb. 1918.)

Pin balls.

Map and picture puzzles, using coping saws.

Case or box for above.

Games such as: *Checker boards* of wood, and checkers. Folded board of cardboard and of wood.

Case or box for above.

Chess board and men of round discs with the men drawn or printed on

Solitaire boards.

Cribbage score cards.

Ring toss games.

Bean bag games.

Ping pong se's.

Box ball sets.

Puzzles (to pack flat).

Mechanical puzzles.

Splints of bass wood and Yucca pine wood (cut according to Red Cross specifications: length 17½″, width 3¼″, thickness 3/32″).

Crutches (from models obtained from drug store).

Hospital trays (from models obtained from hospitals or Walter's Surgical Supply House).

Stretchers (according to military specifications).

Canes (any good strong wood with crook).

Convalescent canvas chairs.

Back rests for convalescent patients (flat boards 32″ long, 18″ wide and 1½″ thick).

Bedside chart holders (models obtained from the Hospital Supply Store).

Bed trays.

Bed cages.

Apparatus for outdoor sports and athletics such as baseball bats and *jumping standards.*

Bird cages for Y. M. C. A. Building.

Flower boxes for Y. M. C. A. Building.

Chess men (turning problems).

*For detailed directions for making problems readers should consult the local Military or Red Cross headquarters.

How Carpenters' Clamps Were Secured Under Pressure

Joseph J. Eaton, Principal Saunders Trade School, Yonkers, N. Y.

We needed some more carpenters' clamps and there was no money with which to buy them. With necessity as a spur invention came to our aid and the clamps which we made are now an important part of our shop equipment as well as the forerunner of one of our regular shop projects.

These clamps have several distinct advantages over the old style steel clamp; first, they are so much lighter that they may be handled easily; second, they will stand readily in an upright position when placed on the bench. Anyone who has used a long, all-steel carpenters' clamp knows how difficult it is for boys to lift and adjust them. The user of hot glue realizes the value of time and the aggravation of clamps falling over after the job is just ready to be clamped together.

As the beam and several other parts are made of wood this style is not so strong as the regular manufactured ones, but they are strong enough for most jobs. Then again, one cannot secure as great a pressure as with steel clamps, but the pressure is great enough to serve most school purposes. As some of these clamps have been in use for several years and many desks and table tops have been glued together with their aid, there is no doubt of their strength and durability.

All wooden parts are made of maple. Possibly some substitute for that kind of wood may be found but we have not discovered it.

The beam is made from ⅞″ stock, 2¾″ wide, and 40″ long. This length may be increased indefinitely provided the width is also increased proportionately. On both sides of the beam are grooves 7-16″ wide and ¼″ deep. These may be cut out on the circular saw or planed out with a rabbet plane. On the top face is a series of holes bored ⅜″ deep and ⅜″ in diameter. The holes are 2″ apart. As may be seen, these holes are designed to allow for adjustments in gluing operations.

The head is made from maple 1⅞″ square. The lower part is forked so that it fits snugly into the cross grooves prepared in the beam. Thus we have a sort of open mortise and tenon joint. Two bolts ¼″ in diameter complete this part of the clamp. If the head is made 3¾″ long it will project above the beam a distance of 1¾″. Seven-eighths inches from the beam a hole is bored thru the head, parallel

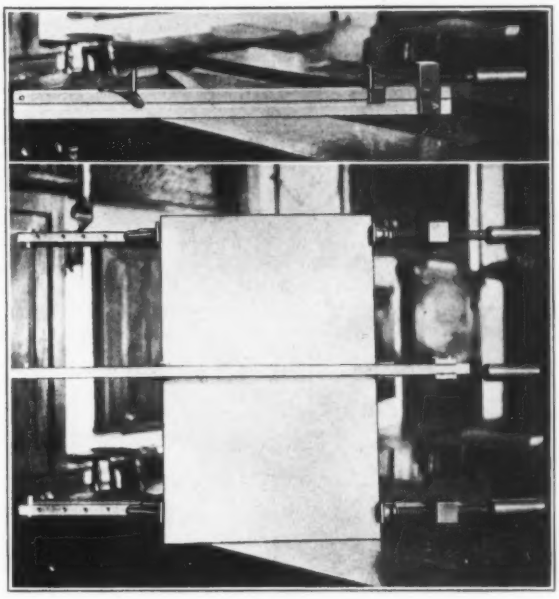
to the beam, with a $\frac{3}{4}$" bit. This hole is then tapped out with a special wood tap $\frac{7}{8}$"x12". If the head piece is allowed to soak in boiled linseed oil for eight days before the thread is cut the maker will secure a cleaner and stronger thread.

The screw is made from a piece of rock maple, $1\frac{5}{8}$" stock, with the handle turned down to a diameter of $1\frac{5}{8}$". This handle ought to be about $6\frac{1}{2}$" long and rounded at each end as indicated by the drawings. When finished the screw part should be $\frac{7}{8}$" in diameter and about 10" long. This latter length includes a nose part $1\frac{1}{8}$" long and 11-16" in diameter. As may be seen, this smaller end is cut a size less than the lower portion of the thread and is allowed to project into the head jaw casting. Before cutting the thread with the special wood cutting die be sure to soak the wood in linseed oil for several days as has been described previously regarding the head. This, of course, is done after the part has been turned down to size and otherwise finished.

This soaking process is not expensive nor difficult. Any long rectangular pan may be used and all oil left over may be used for other purposes, as it will not be injured.

Two castings are necessary, but patterns for these may be made in the carpentry shop. If proper care is exercised in making the patterns no machine shop work will be necessary after the castings are secured. The castings may be greatly improved, however, if the inner surface is smoothed with a file. This will insure less friction, which will mean easier adjustments and less wear. In making core boxes proper allowance should be made for clearance to permit the head and tail jaws to slide freely on the beam.

At the tail end of the beam is a short $\frac{3}{8}$" dowel which is inserted in the beam to prevent the tail jaw from falling off when the clamp is not in use.



Clamps made in the Saunders Trade School.

WORK FOR BOYS IN JUNIOR RED CROSS.

Boys as Junior Red Cross members are finding a constantly widening field of activity. The making of surgical dressings, knitting, sewing hospital garments, and other phases of the work are peculiarly tasks for girls, and so they have not been undertaken in general by boys. But making packing boxes, doing construction work at chapter headquarters, getting up entertainments and performing services for pay as a means of raising funds for the Junior Auxiliaries are affording plenty of scope for their energies.

The results thruout the country of the Junior Membership Campaign in the schools is gratifying to the officials of the Red Cross at Washington. Superintendents, principals, and teachers have co-operated in a way that assures the enrollment of a large percentage of the 22,000,000 school children in the United States. Added to the 24,000,000 members already in the Red Cross, it means that virtually one-half the population of the country is directly interested in this great humanitarian agency. The work of organizing the schools will continue the remainder of the school year.

It is probable that the increasing loss of American soldiers in France and on the seas stimulated the school authorities and teachers to extra efforts in behalf of the Red Cross, which has so large a part in the handling of the wounded and relief of other kinds of distress.

Out of the 360,000 schools—public, private and parochial—it is hoped ultimately to have virtually all organized as Junior Auxiliaries, and the amount of Red Cross supplies which the pupils will turn out is incalculable. The smaller pupils can make garments for the destitute people in the war area and the larger high school students under approved conditions can make surgical dressings.

There is no desire upon the part of the Red Cross to interfere with the progress of the children in their regular studies. All that is asked is to fit the Red Cross work into the curriculum in a reasonable way and, perhaps, to induce the children to give some spare hours to making hospital and other supplies. As the magnitude of this sinks into the minds and hearts of the American people, it will be realized that this is a necessary duty for the children.

When the Red Cross this spring comes before the American people again to ask for another $100,000,000 war fund, the value of the Junior members will become apparent, for these children will take the message and the function of the Red Cross into homes that otherwise could not be reached.

Especially valuable will be the influence of children of foreign extraction in carrying the lessons of patriotism and democracy to their parents and other adult members of the family from the Junior Auxiliaries. It is impossible to assemble the parents for purposes of patriotic propaganda, but the children can be reached daily in their classrooms by teachers who are alert to this opportunity of helping their country.

President Wilson considers the Junior Red Cross one of the most important phases of war activity in the United States and the same opinion is held by Mary C. C. Bradford, president of the National Education Association, Cardinal Gibbons, speaking for the Catholic schools, and many other educators.

ILLINOIS MANUAL ARTS TEACHERS MEET.

The fifteenth annual meeting of the Illinois Manual Arts Association was held February 15 and 16 at Ottawa. While the attendance was not as large as usual, the program was excellent and thoroly enjoyable. With the president, Capt. L. A. Tuggle, absent on war duty, the entire responsibility for the meeting devolved upon Mr. H. J. Barber, the secretary, to whom much credit is due for his untiring efforts.

A unique feature of the program were the various demonstration talks scattered thruout the meeting. Mr. Edward F. Worst, of Chicago, in "A Practical Demonstration in Plastic Materials" showed what can be done with cement in the ordinary school shop. He described the making of the molds of glue, plaster and wood, and gave formulas for mixing. Mr. Worst talked about the finished examples and his assistant showed the handling of the material. In a similar way Miss Olson, of the Harrison Technical School, treated the textile work. With the aid of a loom and one of the students, Miss Olson made a sound, pedagogical and practical plea for the revival of home weaving as a handicraft. Miss Olson declared that in some sections of the city, it might be possible to utilize the industry as a home craft tho the prejudice of landlords might have to be overcome. In describing the textile schools of Stockholm, Miss Olson appeared in her bright-colored native costume and showed examples of her own work. Another practical demonstration was that made by Mr. A. G. Bauersfeld, of Lane Technical High School, Chicago. With steel framing squares and dimension stock, he conducted a class, with members of the association as pupils, demonstrating various methods used in building construction.

Mr. S. J. Vaughn, who presided at the banquet, introduced Supt. John D. Shoop, of Chicago, who gave an in-

spiring talk, holding up the ideals which all manual arts teachers should strive for. Mr. Wm. J. Bogan, of the Lane Technical High School, presented the work of the evening schools in an excellent manner.

The Saturday program included the following "war" features: Food Conservation by A. W. Jamison, University of Illinois, who presented some of the imperative demands which must be met by the country; Miss Mary E. Fuller, of the Lucy Flower Technical High School of Chicago, showed the possibilities in furthering the work of the Red Cross; Miss Lucile Wheeler, of the domestic science department of the University of Illinois, discussed "Food Problems" and showed the possibilities of the school in backing the food administration. She pointed out that it is easier to solve the problem in the home thru the younger children, because of their enthusiasm and the interest of the parents in their work.

Dr. L. G. Weld, president of the Pullman Free Manual Training School, gave an interesting illustrated talk describing the history, ideals and methods of this unique school. With an endowment of $3,000,000, twenty acres of ground, splendid equipment and unhampered by traditions, this school is committed to a practical form of education which is being worked out in a most interesting way.

Mr. O. L. McMurry, of Chicago, showed some slides illustrating "Period Furniture." He pointed out that most of the artistic furniture had been designed by the practical craftsman and that when the designer and worker parted company and became two separate individuals, the work degenerated. Methods of adapting the art in the best period furniture to problems of the school shop were well brought out.

Mr. N. F. Fultz, of Anderson, Ind., described the problems of his state in working out vocational education. He compared Indiana and Illinois and pointed out how the latter state could profit by Indiana's experiences.

Mr. L. C. Peterson, of the State Normal School, Carbondale, decried the lack of seriousness in American youth as compared to the youth of Europe and believed much could be done by the industrial arts teachers to correct this attitude. He made a plea for greater attention to forms of education which would keep the youth on the farm. Mr. A. C. Newell, of Normal, spoke of the shortage of teachers and compared the school trained and the practical man. Mr. F. O. Edwards pleaded for greater attention to content value in elementary work, developing the work on a study of industries rather than on a study of technical problems.

At the business session, A. G. Hill, of Rock Island, was elected president; Miss Jenny Show, of Chicago, vice-president, and F. O. Edwards, of Springfield, secretary-treasurer. A committee consisting of L. W. Wahlstrom, S. J. Vaughn and A. C. Newell was appointed to revise the constitution and to reduce the dues of the members. A telegram of appreciation was sent to Capt. Tuggle.

The next meeting of the association will be held at Rock Island. This will be a joint meeting with the Iowa Manual Arts Association and plans are being made for making this the banner meeting of the association.

L. W. Wahlstrom.

NATIONAL SOCIETY IN CONVENTION.

Changes Name to National Society for Vocational Education.

A change in its name and in the scope of its activities is the outstanding effect of the eleventh annual convention of the National Society for the Promotion of Industrial Education which will hereafter be known as the National Society for Vocational Education. The convention brought together more than five hundred leaders for the discussion of four problems which are pressing for solution—vocational education for the war, the administration of the Smith-Hughes act, a program for vocational training in twentieth century industry, and the reorganization of the society.

The convention marked the transition of the society from the promotional attitude which it has taken to the co-operative and scientific spirit which is to mark its work in the future. Its new constitution and the election of a professional educator as president are also indications of this transition.

The speakers of the first day's meeting include Mr. Hugh Frayne, who represents the American Federation of Labor on the War Industries Board; E. E. MacNary, head of the industrial training department of the Emergency Fleet Corporation; Arthur L. Williston, director of the Wentworth Institute of Boston; James P. Munroe, of the Munroe Felt and Paper Co., Boston; Charles A. Prosser, director of the Dunwoody Industrial Institute, Minneapolis; A. C. True, director of the States Relations Service, United States Department of Agriculture; Layton S. Hawkins, assistant director of the Federal Board of Vocational Education; and Miss Josephine T. Berry, assistant director of home economics on the federal board.

Mr. Munroe, in speaking for the Federal Board of Vocational Education, outlined the provisions of the Smith-Hughes act. He argued that the greatest need of vocational education today is the training of a sound body of teachers who are familiar with the features they will teach and with teaching methods and practices.

Dr. C. A. Prosser complained of the conscription of teachers into the army. He said: "The growing demand upon industrial, trade and technical schools and colleges for training mechanics and technicians for the army as well as for industry, makes it absolutely imperative that the instructors in these schools who are subject to draft should in some way be left to teach in their present positions as long as they are needed. Otherwise the great army of the conscripted men who are to be trained for army occupations thru these schools cannot be so instructed, nor can industry secure those conscripted. It is expected that some arrangement will be made by the government so that when the draft call of these teachers is reached, they may be placed on the inactive list without pay, and continue their teaching until such a time as their services are no longer needed to prepare men for war or war industries."

Mr. Frayne, in his address, urged the recognition of the skilled workers and argued that the actual practices and processes of the trades should be taught in the shops by experienced practical journeymen with ability to impart knowledge. At one of the round-table conferences, Prof. David Snedden pointed out the absurdity of assuming that instruction in technical knowledge is more important than industrial skill. Mrs. Mary Schenck Woolman and Miss Josephine T. Berry argued for actual home experience on the part of teachers of home economics.

One of the most important papers of the day was read by Mr. E. E. MacNary, of the United States Shipping Board. Mr. MacNary told how the scheme for training men at the shipyards is being worked out. "Industrial training," he said, "is the crux of the whole situation. We cannot win without ships and we cannot get ships if we lack trained shipbuilders. At present we do not have enough skilled men." Mr. Arthur Williston, of Boston, pointed out the need of training men to replace those who have been drawn away from our industries, transporation facilities, etc.

After the war education constituted the chief topic of the second day's program. Maj. J. E. Bloom advised the training of enlisted men in munition factories and shops, and Miss M. Edith Campbell made an eloquent plea for co-operation in the training of women. Women are in the industrial field to stay, she said, and many of the men who return from the trenches having felt the call of outdoor work, will not go back to the shops and mills but will take up agriculture instead. It will be up to the women to see that the work inside is done. Another important paper was read by Mr. C. R. Dooley, of the Westinghouse Company, who described the industrial school operated by the corporation at East Pittsburgh.

At the final session of the convention the constitution was revised so that the association will include in its activities all kinds of vocational education. A general council of 27 members was organized to act with the officers and to outline the general policies of the association. An educational council was also formed to consist of one member from each state and to be elected or appointed by the recognized educational association of the state. The general council and the educational council are to choose the executive committee of seven which with the president, vice-president, and treasurer, will be the governing body of the society. It will replace the managers who formerly controlled the organization.

The next convention will be held in St. Paul. The officers elected are: President, Dr. David Snedden, New York City; Wm. L. Lyall, vice-president, Passaic, N. J.; Frederick B. Pratt, treasurer, Brooklyn, N. Y.

VOCATIONAL EDUCATION AT THE DEPARTMENT OF SUPERINTENDENCE.

Vocational education formed one of the most important topics of discussion at the convention of the Department of Superintendence of the N. E. A., which was held in Atlantic City, N. J., February 25 to March 1.

The leading address of the week was presented by Maj. W. H. Henderson, who discussed the re-education of disabled soldiers. Maj. Henderson pointed out tne necessity of keeping disabled men in uniform until so far as possible they have been rehabilitated physically, mentally and vocationally, so that they may be self-reliant and independent members of society and self-

supporting citizens. He described the methods which are being evolved at the present time for training the soldiers who have been returned from France and who are now at Fort McHenry. The plan, he said, involves not only the re-education of the men but also the training of teachers for the work.

At the annual meeting of the National Council of Education, Dr. Charles A. Prosser, federal director of vocational education, explained in detail the program of the Federal Board of Vocational Education in administering the Smith-Hughes law. He pointed out the necessity of co-operation with the federal supervisors and argued for the training of conscripts in the national army.

The National Vocational Guidance Association held an interesting session at which war problems in vocational adjustment were discussed. Prof. Arthur D. Dean, of Columbia University, presided and addresses were made by Meyer Bloomfield, Dr. W. D. Bingham, W. E. Hall, John R. Shillady, and W. Carson Ryan, Jr.

"GATHER UP THE FRAGMENTS."

How a Class in Industrial Arts at Youngstown, Ohio, is Helping the Red Cross.

M. L. Burris, Youngstown, Ohio.

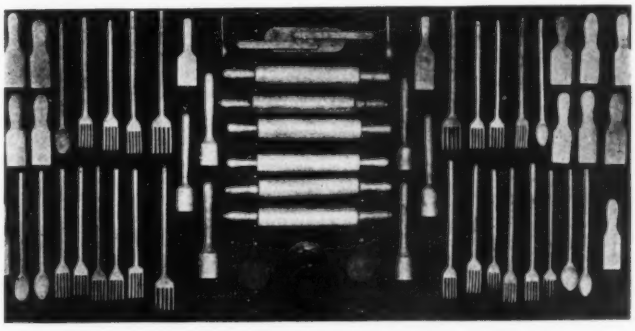
When the girls began knitting, many of them surpassing their mothers both in quality and in quantity, the question arose, What can the boys do? The soldiers at the front, as a matter of fact, have no use for the articles they produce, but every penny they earn will be most acceptable. The Youngstown boys are making a "drive" which bids fair to be successful both as a financial venture and as an educational experiment.

Their plan for earning some ready money for the Red Cross is simple enough. Scraps of lumber too good to be burned and unfit for ordinary shop projects are being made into useful articles and sold for cash. In most cases the boys find a need for the things in their own homes and voluntarily purchase them. It is not at all unusual for them to receive an order for a duplicate.

To say that the boys are interested expresses it but mildly. There is not a slacker among them. Their hearts are in it. They are thinking and they are giving their instructor something to keep him awake. Questions are fired at him thick and fast. "How much ought this to bring?" "Is twenty-five cents enough for this?" Thinking of their labor and products in terms of dollars and cents is in most cases a new experience. The training they are getting in estimating values, not to mention other benefits, is proving to be worth while. For the first time it seems to have dawned upon them that poor work of whatever nature is not worth anything.

Many of the problems or projects, altho seemingly insignificant for high school boys, stimulate originality of design and construction to a greater degree than any other set of a similar nature previously undertaken. Honor is being given to whom honor is due. Each boy is being credited with the amount he earns and a spirit of rivalry is noticeable.

Articles for use in the kitchen were the first to be made. Nearly every boy seemed to be reminded of something his mother had expressed a desire for. A few models were displayed and they suggested others. Scraping knives for aluminum ware, pot and pan scrapers, paddles for butter and vegetables, stirring forks and spoons took and held the lead for a considerable time. In a number of cases the models first worked out were improved and each improvement received favorable comment. The list of articles continues to grow and to go also, for the boys are finding a market for them. Nearly every day some boy makes a new contribution. Emerging from that pile of odds and ends is an endless array of useful articles—glove darners, stocking eggs, match holders, newspaper holders, plant stands, hot-dish supports, clothes line winders, salt boxes, napkin rings, toy wagons, toy furniture, foot rests, foot stools, jardinieres, scrap baskets, etc. Nut bowls and nut picks will become winners. We make the picks out of horseshoe nails set in turned handles. Ferrules may be cut from brass pipe.



Articles for Kitchen Use Made Under the Direction of Mr. Burris.

The "drive" will be concluded at the annual exhibition of shop products, but we are seizing time by the forelock and disposing of all we can as we go, a bird in hand being worth two in a bush. A dollar was turned in today for two foot rests. A pair of Indian clubs brought seventy-five cents.

Now that spring is approaching, naturally enough we are thinking of stakes, seed boxes, flower boxes, flower pot racks, cold frames, and the like, which will afford us an abundant opportunity for going "over the top" with results that nobody will need to be ashamed of.

DR. DAVID SNEDDEN,
New York, N. Y.
President-Elect, National Society for Vocational Education.

THIRD ANNUAL BETTER COMMUNITY CONFERENCE.

On April 5-7 at the University of Illinois, Urbana-Champaign, will be held the Third Annual Better Community Conference. Like most meetings this year the program has to do with war problems. The State Council of Defense is co-operating in the conference and participating in the discussions.

On Friday forenoon a series of group meetings will be held for the purpose of considering the special problems of such associations as wish to arrange for a half-day session to themselves. The remaining sessions on Friday, Saturday and Sunday will be held in the auditorium. A cordial invitation is extended to all community leaders and lay workers to attend these sessions.

Community significance of recent campaigns for the Liberty Loan, Red Cross, Y. M. C. A. and library will be considered. Food production and conservation will have an appropriate place both on the program and in the exhibits.

PROBLEMS AND PROJECTS

The Department of Problems and Projects, which is a regular feature of the INDUSTRIAL-ARTS MAGAZINE, aims to present each month a wide variety of class and shop projects in the Industrial Arts.

Readers are invited to submit successful problems and projects. A brief description of constructed problems, not exceeding 250 words in length, should be accompanied by a good working drawing and a good photograph. The originals of the problems in drawing, design, etc., should be sent.

Problems in benchwork, machine shop practice, turning, patternmaking, sewing, millinery, forging, cooking, jewelry, bookbinding, basketry, pottery, leather work, cement work, foundry work, and other lines of industrial-arts work are desired for consideration.

Drawings and manuscripts should be addressed: The Editors, INDUSTRIAL-ARTS MAGAZINE, Milwaukee, Wis.

CASTING IN SMALL QUANTITIES.

Edward Soderstrom, Oklahoma Agricultural and Mechanical College, Stillwell.

From time to time questions have appeared in various trade journals relating to the melting of iron in small quantities. The art of making castings seems to be the least discussed of all subjects, and "to start the ball a rolling," I will give my experience along that line.

We sometimes need one or more small castings for some special work, the total weight of which will not be more than 75 or 100 pounds. This is too small an amount to use the big cupola for, and the need may come at a time when a heat cannot conveniently be poured with the large cupola for two or three weeks; or, as happens in our work here, the need may come when there is no regular class in foundry practice. To fill this need I have made a "baby cupola." It consists of a section of a hot water heater 15″ in diameter by 40″ long with a lining 2½″ to 3″ thick made of one-fourth red clay and three-fourths ganister. The pure red clay would serve, but the ganister lasts longer.

Originally I put in but one tuyere—a 3½″ gas pipe slanting downward at an angle of about 60° and striking the cupola 10″ above the bottom. Later when I saw the possibilities of it as a demonstration cupola, I set it up on a permanent base and made a wind belt out of 3½″ gas pipe and put in four 1½″ nipples for tuyeres, thus facilitating obtaining a gentle draft which is important in a small cupola.

In order to operate properly the coke and iron must be broken up fine, the coke in chunks the size of an egg or smaller and the iron into pieces of only a few ounces each. There must be no fine screenings or dust in the coke, as it forms layers shutting off the draft; in fact nothing fine enough to go thru a ½″ mesh riddle should be used. I use only the finer grades of scrap iron of high silicon content, such as stove iron, old radiators, ornamental castings, etc.

The cupola is not connected with the flue and there is no necessity for it as the fumes readily pass out thru the roof ventilators. For draft I connect with a plate hole on the large cupola.

In summary, castings may be made with very inexpensive equipment and in small quantities.

HANDY STEAMING OUTFIT CHEAPLY MADE.

Harlie Garver, Hastings, Neb.

When it was desired to steam some wooden parts for bending in the school shop recently, a handy steaming outfit was quickly rigged up from odds and ends about the shop.

The steamer, which is usually the most expensive part of such a contrivance, consisted of several lengths of stove pipe, the two open ends of which were closed by a contrivance consisting of two circular pieces of waste wood, one sawed to the inside diameter of the pipe, and the other made slightly larger, the two being nailed together and the smaller of the two pieces inserted into the pipe. The swelling of the wood due to the steam served to make this joint tight. The joints between the lengths, being smoke tight, allowed little steam to escape.

The boiler consisted of an old tea kettle set on the gas jet used for the glue heater, and the steam was led to the steamer by a length of cast-off ¾″ hose, the hose being attached to the steamer by being forced thru a hole bored into the wooden end referred to above.

This steamer is advantageous in many ways. The stove pipe is large enough to accommodate almost any class of work to be bent, and saves time in steaming because of the small space to be heated. As an added advantage the length can be readily changed to accommodate any class of work, whether it be a short sled runner or a pair of skis.

THE BABY CUPOLA.
A "Cast" in the Foreground.

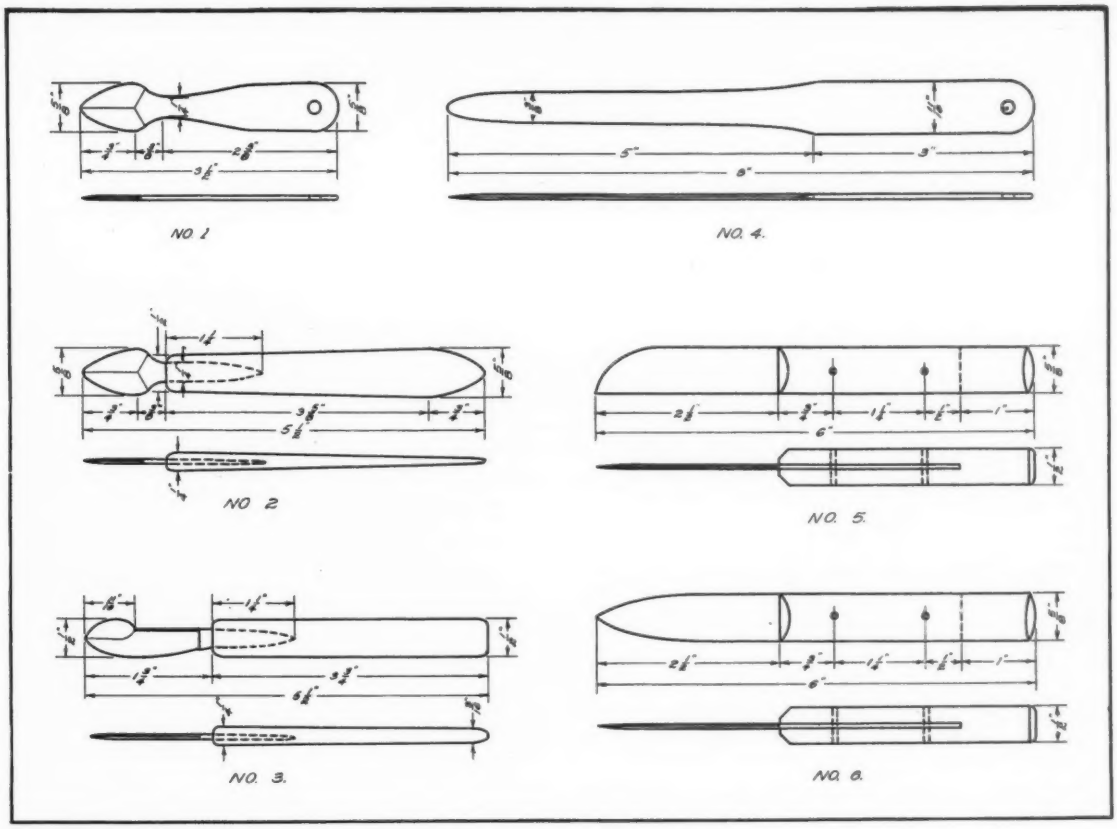
EMERGENCY METHOD OF MAKING RED CROSS KNITTING NEEDLES.

R. C. Shaw, Marquette, Mich.

The making of Red Cross knitting needles is a practical form of patriotism which every school can undertake. Three sizes are usually in demand: For sweaters, 12 to 14 inches long, 3/16 inch diameter; for helmets, 9 inches long, 5/32 inch diameter; for socks, 9 inches long, 3/32 inch diameter. All of these needles can be made in an emergency with means at hand in every school shop.

The writer has successfully made needles in his classes from hard maple and white birch. For the larger needles, the stock was cut to ¼ inch by ¼ inch by 3 feet. It was planed octagonally and cut into 12-inch lengths. One end was sharpened ⅝ of an inch with a pencil sharpener or a pocket knife. The needles were then sanded with 1½ sandpaper in a chuck on a lathe, and were finished with 00 paper.

The chucks were the regular type used for holding boring bits or were made of wood. In the absence of sufficient lathes, needles were fastened in hand drills, the han-



SOME USES FOR BROKEN HACKSAW BLADES.

Sanding Red Cross Needle.

dles of the drills were fastened in bench vises and the sanding was simply done by turning the drill. As a means of testing the thickness of the needles a 3/16 inch hole was bored thru a thin piece of metal. The knobs at the end of the needles were made of common upholstery tacks.

For helmet and sock needles the stock was cut to 3/16 by 3/16 inches by 3 feet. It was planed and sanded the same as sweater needles and sharpened $\frac{1}{4}$ inch at both ends.

A dowel cutting machine such as has been placed on the market recently could have been used to save the planing and rough sanding.

SOME USES FOR BROKEN HACKSAW BLADES.

Earl D. Hay, Instructor, Industrial Department, Oshkosh Normal School, Oshkosh, Wis.

The accompanying drawing shows some useful articles which may easily be made from broken or worn out hacksaw blades or from short pieces of broken bandsaws. Numbers 1, 2, and 3 are drawings of ink erasers. They are first ground to shape on an emery wheel and then ground to an edge and polished on a fine stone. No 4 is the drawing of a paper knife or letter opener. It is made in the same way as the ink erasers but is not ground to an edge. Drawings No. 5 and No. 6 represent two very useful paring knives. They are made by grinding the blades to shape, drawing the temper from the part which enters the handle, inserting in the stock, drilling holes thru both the metal and wood, and fastening with copper or brass rivets. After the handle is finished the blade is ground to an edge.

The three-quarter inch saw blades are the best for these articles but the half-inch or three-eighths blades will do for all but the letter opener. The handles of the paring knives should be made of beech or maple and oiled. The handles of the ink erasers are usually made of some wood which can be stained and given a nice finish.

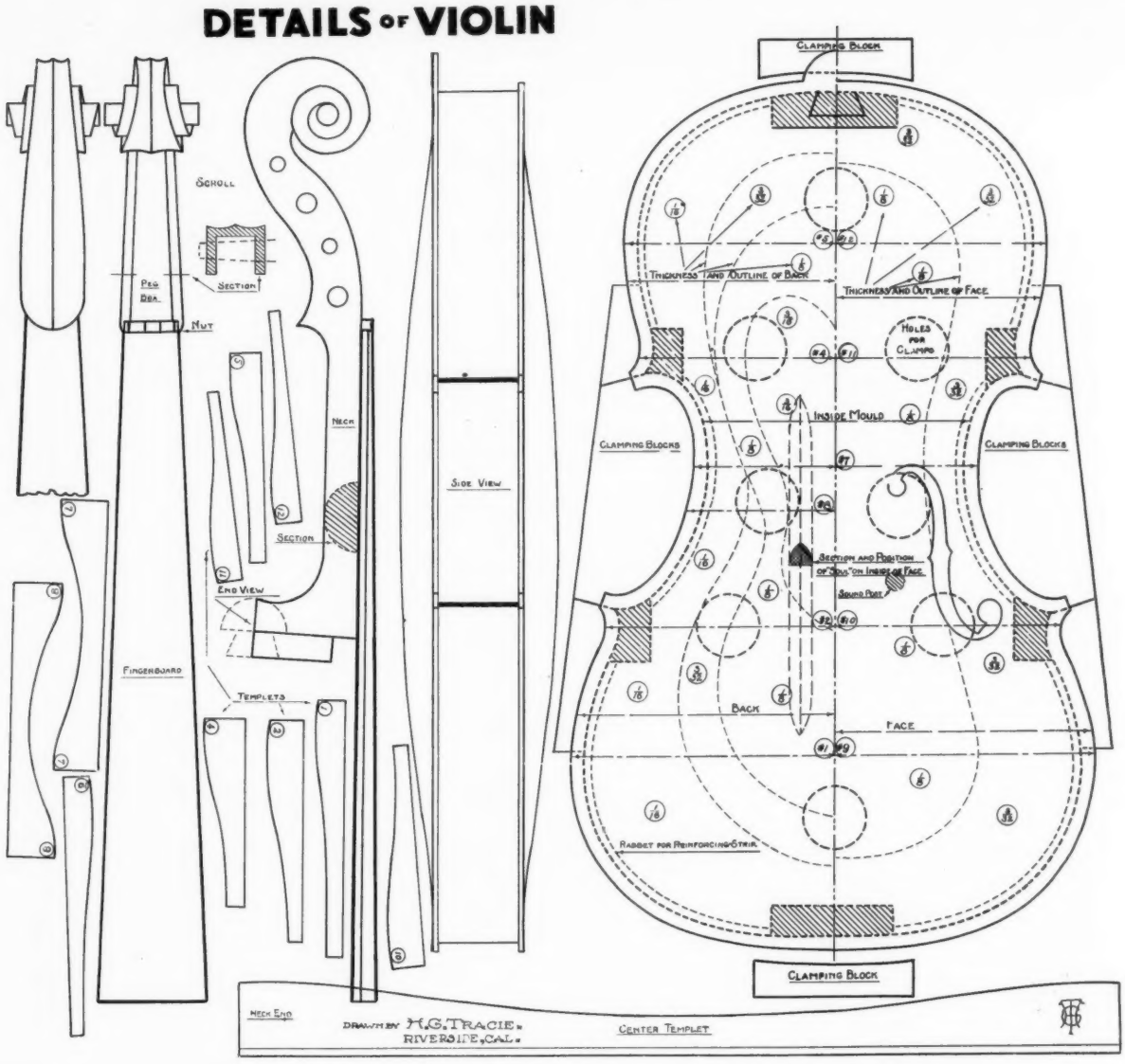
An opportunity to make such an article as one of the above, after completing a difficult exercise in the forge shop, gives a certain amount of relaxation to a student and also acts as an incentive to the slower members of the class if these exercises are given only to those who keep up with the schedule.

VIOLIN MAKING IN SCHOOL SHOPS.

H. G. Tracie, Elsinore, Cal.

With the proper working drawings and specific directions a violin is not a difficult piece of work. During the school year 1916-17, two violins and a violoncello were made by high school students in the writer's department. The instruments were very neat in workmanship and have been pronounced beyond the ordinary in tone. One violin was made of ash, the other of birdseye maple, and the cello was made of curly maple.

The writer prepared a drawing showing every part of the instrument in full size and indicated clearly the shape of the inside form for shaping the bent rim and of the templets for shaping the surface of the back and face. The thickness of each part of the back and front, which varies from three-sixteenths to one-sixteenth of an inch, was shown and contours were introduced showing where the variations in thickness are made.



DETAILS OF VIOLIN DESIGNED BY MR. TRACIE AND MADE BY HIS STUDENTS.

Following are the instructions given students to accompany the working drawing: Obtain

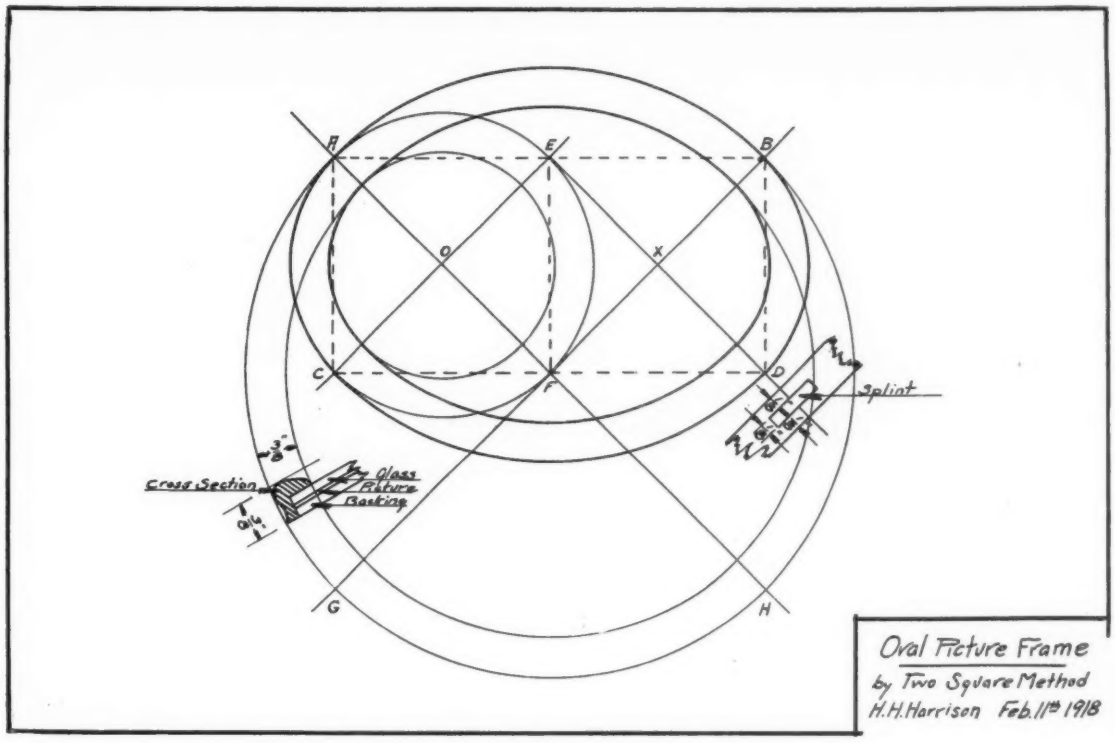
2 pieces 1/16″x1⅜″x17″ maple
2 pieces 1/16″x1⅜″x6″ maple.
1 piece 1¾″x4½″x15″ maple.
1 piece 1¼″x4½″x15″ vertical grain fir.
1 piece 1¼″x2¼″x11″ maple.

Re-saw the two pieces 1¾″x4½″ to ⅞″x4½″x15″ and join the edges which grew together. Glue with hot glue to ⅞″ x9″x15″, the maple for the back and the fir for the face of the violin. Have the body form band-sawed according to the drawing 1¼″ in thickness, bore the holes for clamps and rabbet corners of both sides ⅜″x⅜″ for the insertion of the reinforcing strips on the inside corners of the violin. Fit soft wood blocks in the sharp corners at side, also in the space at each end, the grain of these running from the back to the face of the instrument. The two short, thin pieces of maple 1/16″x1⅜″x6″ are wet with hot water and bent into the short curves or "bouts" at the sides of the form. Remove when dry and bend the longer thin strips around the ends from sharp corner to sharp corner and remove when dry. Fit intersecting corners to sharp edge, glue to corner and end blocks, clamp, and let dry.

The bent band should now fit snugly around the form, leaving the space ⅜″x⅜″ to fill in with the soft wood strip which is glued to the inside edge of the bent band to reinforce the same where it is glued to the back and face. When dry, trim the band flush to the surface of the form. Take the maple which was glued up for the back of the violin and mark the outline of the instrument thru the drawing. After sawing with a coping saw, gauge the edge 3/32″ from what will be the inner or concave side and clamp to the bench for carving.

The templets can be cut from cardboard or tin and numbered according to the drawing. Use the long one first, carving a groove with a ⅜″ gouge until the templet touches all along and each end rests on the gauge mark on the outer edge. The other templets are used in the position shown on the drawing. Carve until one end rests on the center groove and the other end on the gauge mark.

When all the templets have been placed, cut away the material between the grooves to the gauge mark on the edge. Work carefully and finish with file and sandpaper to a smooth surface. The concave surface is gauged from this finished side with calipers and carved away to the thickness given in the drawing.



DETAILS OF OVAL PICTURE FRAME.

For the face side of fir repeat the operations as before; then cut sound holes where shown, boring the holes at the ends first.

Shape the "soul" and glue it in the position indicated. This is a truss to bear the pressure of one side of the bridge, the sound post supporting the other.

The neck and scroll are one piece, so mark side of the 1¾"x2¼"x11" maple and saw to shape, then mark face and cut to outline. As the side, front and back are all shown with various sections, the carving will be found surprisingly easy. Finish with file and sandpaper to surface. Clamp the peg box to avoid splitting while cutting out. Bore peg holes ¼" and carefully ream to fit pegs. Fit and glue the neck to the frame, then glue on the back. Use blocks to prevent clamp marks. Do not clamp too tightly. Have the margin the same all around. Let the glue set, then fit and glue on the face side. Make the sound post as shown, 1¾" long, and bore a 1/16" hole thru the side in the center. Use a piece of stiff wire in this hole to fit and place the post in position thru the large end of the sound hole. Glue in place.

The nut, finger-board, pegs, tail-piece and tail-peg are ebony and are purchased from a music instrument dealer.

Glue on the nut and finger-board and sand the whole instrument with number 0 sandpaper. For a natural finish rub in a coat of raw oil, let dry, then put on two coats of thin white shellac, rubbing each coat smooth with pumice stone and oil. Finish with a thin coat of good varnish.

The writer would class a violin as a particular but not a difficult job for the high school shop. The tools required are such as are found in any school shop. In the Elsinore Union High School only the ordinary bench tools were used.

OVAL PICTURE FRAME BY THE TWO-SQUARE METHOD.

H. H. Harrison, Marshall, Mich.

No doubt the reader has many times constructed ovals by the two-square method. Take any two squares such as A, B, C, D, with their common side E F, draw in their diagonals A F, C E, and F B E D. Using the points of intersection O and X as centers and O A as a radius, draw the arcs A C and B D. Then with E and F as centers and

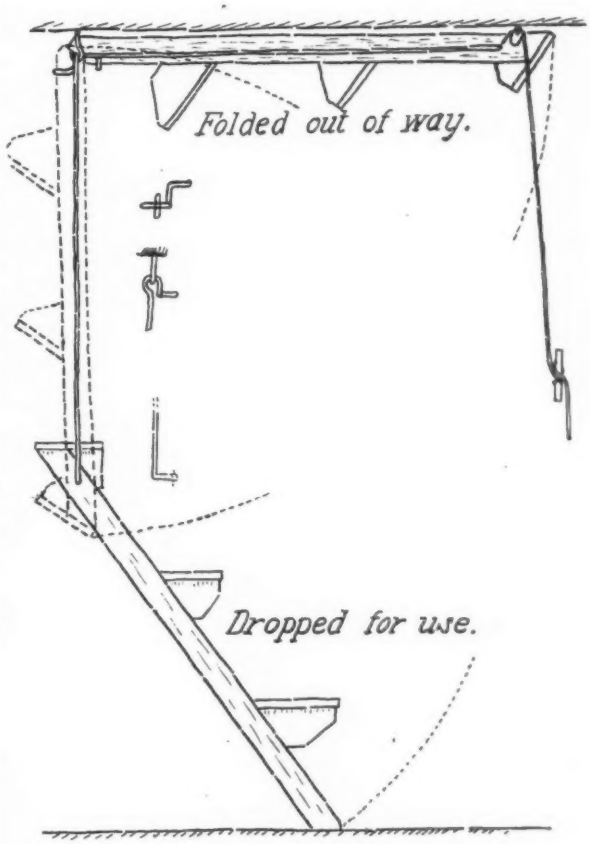


Fig. I. Demonstration Court for the Crowded Shop.

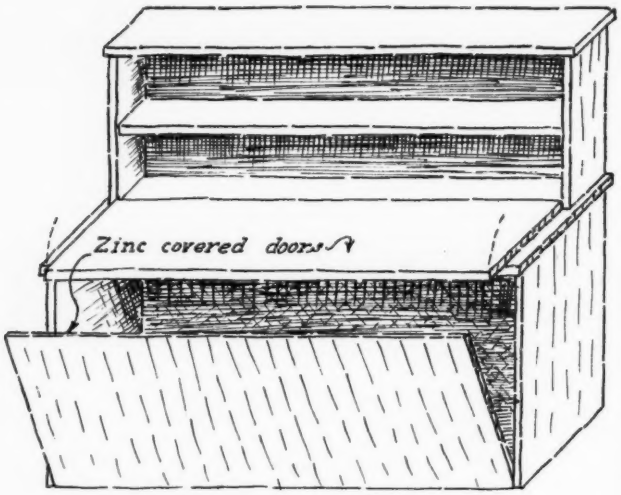


Fig. II. A Fuming and Stain Cabinet of Some Merit.

F A as a radius, draw the arcs C D and A B. The inner oval may then be drawn in a similar manner. This gives yuo the shape of the finished frame.

In constructing this frame we must use the lathe and as ovals cannot be turned directly we must do our turning in the form of circles and then by cutting and fitting produce the oval.

By the face plate method turn up circles A E F C, whose center is O, and A B H G, whose center is F. Turn the back first, cutting in the groove for the glass, picture, and backing as shown in the cross section Now chuck to another face plate using the groove, thus allowing the outside edge and face to be turned.

When the two circles are finished cut them as follows: the smaller on the lines A F, and C E, and the larger on the lines A H and G B.

You will now have enough pieces to make two frames which will joint together at four places A B C D. By using small pieces of the same wood as in the detail at D, a very strong and neat joint can be obtained.

Care should be taken in cutting and cut directly with and across grain and in fitting together, and fit so that the grain will run the same.

SHOP KINKS.

E. M. Wyatt, Director of Manual Training, Houston, Tex.

Every manual training teacher recognizes the desirability, and almost necessity, of some form of demonstration court in the shop, but how often it is impossible for the

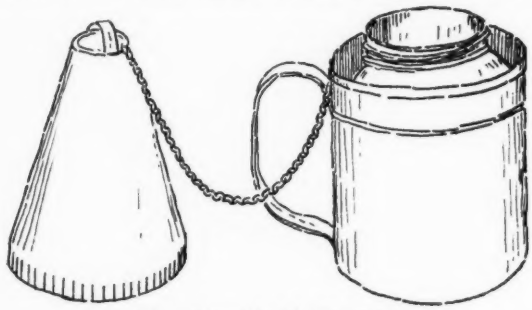


Fig. III. A Cheap Air-tight Shellac Can.

simple reason that there is no room for it. Here is a solution for such shops which has proven entirely successful. (Fig. I.) It serves the purpose, costs little, and is easily gotten out of the way. If it can be located with the back against a wall it can be made still more simple, by simply swinging up against the wall, instead of against the ceiling.

A staining and fuming cabinet of proven worth is shown in Fig. II. The drop doors are metal covered and serve as places for articles while having stains, etc., applied. This protects floor and benches from unsightly smears likely to be found in the most carefully protected shops. The top door when closed shuts unsightly bottles, etc., from view. The fuming box part, when not used for fuming, makes an excellent place out of the dust, for freshly varnished articles for the small shop having no special finishing room.

An excellent shellac and varnish can is show in Fig. III. The space between the glass fruit jar forming the inner part of the sheetmetal outside is kept filled with water so as to make a water sealed can when the lid is put on. The fruit jar can be held in its place by the crimpled in bead as shown in the cut or by a little plaster-of-Paris or cement poured in after the jar is in place.

VOCATIONAL TRAINING FOR THE ARMY AND NAVY.

The War Department at Washington has prepared for the mobilization of the educational institutions of the country and their facilities for special training with the appointment of a Committee on Education and Special Training. Associated with this committee will be five civilian educators to be known as an advisory board of educators. The committee is composed of Col. Hugh S. Johnson, deputy provost marshal general; Lieut. Col. Robert I. Rees, of the general staff; and Maj. Grenville Clark, of the adjutant general's department.

The five advisory members of the committee are: Dr. Charles R. Mann, of the Carnegie Foundation and the Massachusetts Institute of Technology; Dr. James R. Angell, of Chicago, dean of the faculties of the Chicago University; Mr. J. W. Dietz, of Chicago, director of education for the Western Electric Company, president of the National Association of Corporation Schools; Mr. James P. Munroe, of Boston, a member of the Federal Board for Vocational Education; Dr. Samuel P. Capen, of Washington, specialist in higher education.

The duties of the committee will be to mobilize the country's schools and colleges behind the army and to arrange for the technical education of men needed by the several branches of the army, particularly the ordnance, the signal and the engineering departments. The purpose of the proposed work is to meet the great demand for skilled men and technicians thru education and to systematize the efforts of the educational institutions which are already rendering patriotic service to the government.

It is estimated that within the next six months from 75,000 to 100,000 men will be given intensive training in schools and colleges, these men to be drawn from the National Army, and from the registrants under the selective draft.

ISSUE CALL FOR CONVENTION OF TEACHERS OF PRINTING.

Mr. Joseph A. Donnelly, President of the Eastern District of the International Association of Printing Teachers, has just issued a call for the third annual convention which is to be held in Newark, N. J., on March 25-26. In presenting the call to teachers, Mr. Donnelly has departed from the somewhat beaten path of advertising the program of the meeting by urging upon teachers the value of the association as a permanent means of co-operation among teachers of printing and as a means of vitalizing and improving the fundamental principles and methods of teaching the subject.

The International Association of Teachers of Printing is essentially a co-operative organization whose ultimate purpose is to better the industrial education of the boys. This end is gained by promoting the efficiency of the teachers thru the interchange of ideas and opinions, thru the improvement of courses of study and thru the encouragement of printing as a school subject in elementary and high schools and in trade and apprentice schools.

Among the present projects which the association is promoting is a standardized method of instruction which shall supersede the numerous methods and courses which have been developed by individual teachers in different sections of the country. It is proposed that these standardized methods shall be adapted to:

1. Prevocational or graded schools in which printing is a form of manual training and primarily an aid to cultural education.
2. Vocational schools where printing is taught as a trade to boys who are not yet apprenticed.
3. Continuation, evening and co-operative schools where an attempt is made to teach printing as a trade to boys who are regularly apprenticed and who spend a part of each day or evening in the study of printing.

The association has made plans for a strong convention at Newark and will gladly send circular matter concerning its work to any one interested. Full information may be had from Mr. Joseph Donnelly, 444 West 57th Street, New York, N. Y.

NOW, ARE THERE ANY QUESTIONS?

This department is intended for the convenience of subscribers who may have problems which trouble them. The editors will reply to questions, which they feel they can answer, and to other questions they will obtain replies from persons who are competent to answer. Letters must invariably be signed with full name of inquirer. All questions are numbered in the order of their receipt. If an answer is desired by mail, a stamped envelope should be enclosed. The privilege of printing any question and reply is reserved. Address, Industrial-Arts Magazine, Milwaukee, Wis.

Miscellaneous.

767. Q.—(1) What number garnet paper would be most suitable for an 18″ sand drum revolving about 500 revolutions per minute, oak and Oregon pine to be sanded?

(2) As we have no foundry in our immediate neighborhood, and find difficulty in obtaining suitable castings for our machine shop, do you know of any concern which makes a business of supplying castings of small gas engines, also other projects?—*A. T.*

A.—(1) It is not possible to give a categorical answer to this question without knowing for what purpose the lumber is being sanded. Ordinarily 0 and 00 paper will serve for general use.

(2) J. D. Wallace Company, Chicago, Ill., will supply castings for small gas engines and other school shop projects.

Dry Upholstery Leather.

768. Q.—Could you inform me of some method of treating leather upholstering when it becomes dry and wears away rapidly?—*R. E. B.*

A.—Considering the question of your correspondent regarding the treatment of leather upholstering when it becomes dry and wears away rapidly, I would say that this condition is the result of the loss of the fatty stuffing of the leather. When this result occurs there is very little if any remedy, due to the fact that dry rot of the leather has already set in. If, however, merely the surface of the leather is worn away and the material is still tough and pliant, the following formula will, to some extent, restore the surface finish and tend to further lengthen the life of the chair cover.

Carefully mix together the following:
Pyroxylin lacquer, 10 parts
Wood oil (Chinese tung oil), 2 parts
Oil of Mirabane, 2 parts
Acetone, light or heavy, 2 parts
Color, ½ to 1 ounce.

The dry color used may be any spirit soluble or oil soluble yellow, black, brown or red which may be combined in the proportions necessary to produce the desired tint. In order to bring the color into solution save out part of the acetone to be used as a solvent and then add to the above formula. Carefully dust off the leather, apply this material with a spray, but if the latter is not available use a full bodied varnish brush with two-inch black China bristles. Work very fast, applying in full body and do not attempt to retouch any dull spots until the material has dried perfectly hard and free from tackiness in a warm room. Smooth up carefully with 00 paper, dust off and give a second coat where necessary.—*Ralph G. Waring.*

Finishing Problems.

775. Q.—(a) I have frequent requests from boys who wish to remove varnish from old furniture and to restain a darker shade, finishing in the wax polish. To be more exact, a boy wishes to secure the fumed oak effect on a high polish golden oak surface. We have not been able with varnish remover to open up the pores sufficiently to secure the results we desire with a darker stain. Can you suggest a way to overcome this difficulty?

(b) Can a painted or varnished oak surface be cleaned and the finish so thoroly removed that it may be restained in any desired effect?

(c) How is bleaching done with salicylic acid?—*E. H. P.*

A.—Answering this correspondent's inquiry, I will say that in order to change a high polished golden oak to a fumed oak it will be necessary to first remove the old varnish with varnish remover or scraper and while the pores are still damp with the remover, use a steel picking brush in order to entirely remove the filler from the pores. This picking brush is a small circular hand brush with fine steel bristles forced into a metal cap and when brushed with the grain, these bristles tend to flick out the filler material. The same result can be accomplished by using a fine bristle painter's steel paint cleaning brush, altho this will require more scraping and sandpapering than the picking brush. Generally speaking, it is a fairly easy proposition to scrape down to the white wood and clean pores after the varnish has been removed, by sponging the surface carefully with water and then using a properly sharpened scraper either by hand or in the holder.

Following this scraping and sanding to a perfect surface the wood may be stained and fumed as suggested in the January issue, question No. 734. This treatment should suffice for almost any finish, since I have used it to clean a desk top of finely quartered oak which had been stained dead black, the new finish being a rich, full toned brown fumed oak, with none of the coloring matter of the former finish remaining in the pores.

(c) The correspondent also inquires as to how bleaching is done with salicylic acid, and in reply I would state that this method is not practicable and in lieu thereof would suggest that he use a solution for bleaching made as follows:

1. Fifty-eight per cent solution of sodium carbonate in cold water.

2. Fifty-five per cent solution calcium hypochlorite $Ca(C10)_2$ in cold water. Mix solutions 1 and 2 and let stand four days. Keep all mixed bleach in an earthenware or dark glass bottle. Brush on the wood to be treated and allow to evaporate, sand smooth when dry, dust off and proceed to finish as desired.—*Ralph G. Waring.*

Finish for Ski.

785. Q.—In our Practical Arts School we are making twenty pair of ski, which will be sold to the students at cost. How can we best finish them?

We have a pair of Canadian ski. The tops seem to have been given one or two coats of spar varnish, but the bottoms have been treated with some creosote preparation and also have been waxed.—*W. H. S.*

A.—Ski are finished by applying hot boiled linseed oil all over and allowing it to dry thoroly. The tops are then given a coat of black shellac and are striped with red shellac. A final finish of valspar varnish may be given. The bottoms are waxed with paraffine.

In the writer's opinion linseed oil is better than creosote or pine tar for finishing ski. The Norwegian ski makers sometimes simply apply the oil without further finish.—*R. C. Shaw.*

It may be added that one woodsman's method is to heat the ski over an open fire until they are scorching hot and then apply boiling hot pine tar to the bottoms. The tar seems to boil into the wood pores and makes the ski springy. The superfluous tar is wiped off before it becomes cold. The bottoms of the ski are then paraffined and the tops are varnished.—*Editor.*

Enamel Finish.

783. Q.—We have finished a dressing table in white enamel. The last coat wrinkled badly. Can you tell us the cause and how to prevent such action? Our base was flat white sanded down each time. We used two coats of enamel, rubbing the first enamel coat down with steel wool, oil and pumice. Do you think it advisable to try to save the under coatings or base?—*J. C. K.*

A.—The work as practiced was correct so far as the flat under coats were concerned. Before the enamel is applied, three coats of lead, zinc and turpentine should be given, allowing at least three days between coats. As soon as each coat has dried hard, sand smooth and level with No. 1 sandpaper.

The enamel should be applied in a warm room free from dust. Enamel will frequently crawl or wrinkle if applied in a room which becomes cold before the enamel has hardened.

The trouble in the case as outlined by the correspondent is probably one of two things. The first, most likely, has to do with the fact that the enamel crawled because it was applied to a greasy surface, resulting from the use of oil in rubbing down the first coat of enamel. It is a practical impossibility to get varnish to adhere to an undercoat that has been rubbed in oil, even tho that undercoat be washed with soap and water before the second coat is applied. As a matter of fact there is nothing really to justify the use of oil in rubbing work, and much to condemn it. It is a slow method, tends to soften the rubbed surface, and leaves a greasy foundation offering but little, if any, tooth for the next coat. By all means abandon the practice and learn to rub in water. This method is fast, can be readily cleaned with sponge and brush, can be dried with a chamois, and offers a perfect foundation for succeeding coats.

I would advise the correspondent to strip the finish from the table, using hot water with a pound of Gold Dust to a ten-quart pail of water, as a remover. Sponge clean with plenty of clear water. If preferred, use a varnish remover. Let the case dry thoroly, sand clean and smooth, then finish as directed above.

The last cause to which I would attribute the crawling of the enamel, would consider the fact that the material was old and has become fatty, i. e., the oil has partially oxidized and allowed the pigments to separate after application to the surface of the wood. I hardly believe that this was the trouble, but believe that the rubbing with oil on the undercoat caused the trouble, as I have seen similar troubles occasionally in factories, which employ somewhat inexperienced help.—*Ralph G. Waring.*

OHIO INDUSTRIAL ARTS TEACHERS' ASSOCIATION.

The annual meeting of the Ohio Industrial Arts Association was held at Cleveland, February 8 and 9. The meeting was opened with a banquet at the Winton Hotel with about 300 in attendance.

Much credit is due Mr. Roberts and the teachers of the Cleveland schools for the splendid way in which the association was greeted and entertained.

Dr. R. J. Leonard was to address the association but did not appear because of work at other places. In the absence of Dr. Leonard, Dr. Howe, of Case University, and Prof. R. E. Offenauer, of Sandusky, gave two very instructive talks to the teachers. Dr. Howe discussed education as connected with the war. He emphasized the fact that the manual men have a great opportunity to help train the men for war and to do more than they are now doing. He spoke very favorably of the wonderful progress of the training of the soldier boys. In his discussion of the war work he told of the training that the boys are getting in engineering, ship building, gun building, trench digging, radio work, etc.

Prof. Roberts, in his address of welcome, told of some of the work they were doing and where the teachers could go to see this work on exhibit.

Prof. R. E. Offenauer gave an address on the readjustment after the war.

A few of the many good thoughts of his address were: This war and our chaotic condition will help us to solve our great problems. The burden will compel us to reform and to see things as we never have seen them. Individual responsibility to humanity must be increased and it is the task of the school to cause the individual to do this. When the war is over we will teach citizenship in a way different, with more interest and we will know what democracy is. It's a good thing to analyze the way, then analyze the boy. We must place every boy and girl where they will be most efficient. Instead of providing soldiers' homes for the boys put the soldier in training so that he will be self-supporting.

The teachers of Ohio were very much pleased to have with them Mr. S. J. Vaughn and to hear him discuss "The Needs and Demands of the Industrial Arts Teacher." Mr. Vaughn made it plain that no help from the Smith-Hughes law will be given to the present type of manual training and to academic work; the work must prepare the pupil to participate in occupation and manual training but does not point direct to occupations. It is popular to say, we give occupational work and to try to get state aid without delivering the work. Some of the obstacles which will prevent the Smith-Hughes law from fulfilling its mission are:

1. Inspectors not qualified. Vocational people have no fight with the old line of education. It's a good old wagon but it's most rode out.
2. Struggle of academic control of industrial training. Industrial training must succeed or it will be doomed for another century.
3. Teachers to do the job. Ohio should have plenty of teachers.
4. Greed of the politicians to get hold of the state money.
5. In Ohio some of the schools are doing industrial work on a high level.

Mr. Shaw, director of vocational education for Ohio, gave an excellent address on some significant aspects of vocational education in Ohio. Mr. Shaw is well prepared in his work of organization and the manual teachers of Ohio are with him and are ready to co-operate.

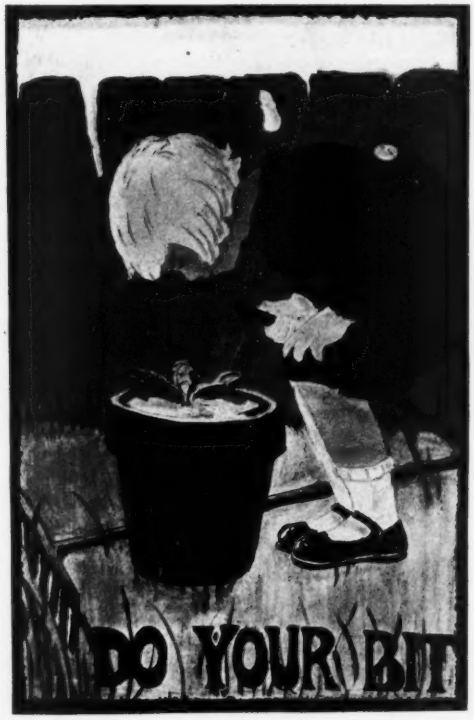
Dr. Spaulding gave an interesting and instructive address on the junior high school movement. Mr. Spaulding branded the present type of manual training as a failure in that it is too general and does not apply to productive vocational occupations. He says it has been considered an appendage to the public school system.

The committee on legislation and the welfare of the industrial teachers made an interesting report and was continued for another year.

The following officers for the ensuing year were elected: President, Roy Jenkins, Wapakoneta, O.; Secretary-Treasurer, E. C. Christy, Cincinnati, O.

It was decided to hold the next meeting in Columbus some time in February.—*Roy Jenkins.*

In connection with the war service of the Belvidere, Ill., High School, an exhibit of Raemaeker's cartoons was held during the month of January. Not only the 150 boys and girls of the department studied the cartoons, but a large number of citizens visited the school to inspect them.



Designed by Abbie Dollin, Erasmus Hall High School. Received First Prize, Gold Medal, High School Poster Competition, New York City.